AMERICAN BEE JOURNAL

JULY, 1921

A SOUTH TEXAS APIARY UNDER MESQUITE TREES. TEXAS IS FAMOUS FOR THE QUANTITY AND QUALITY OF ITS HONEY

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Ulster County Beemen

The Ulster County Honey Producers' Co-operative Association held their annual picnic at Forsyth Park, Kingston, N. Y., May 26.

After lunch Geo. H. Rea gave a talk on "Swarming," which any beekeeper could listen to with profit.

The association roll was enlarged by many new members and all seemed to enjoy themselves greatly.

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MOVING BEES ONE THOUSAND MILES

BY C. S. ENGLE.

WHEN I was a small boy my parents moved from a beautiful farming country in middle Tennessee to Beeville, Texas. At that time there was a terrible drought in southwest Texas. In some places the plains were covered with carcasses of dead cattle. We were told that no rain had fallen for six months, and would have as readily believed none had fallen in six years, from the appearance of the country through which our train traveled.

The country in which we settled was very healthful, with a mild climate. Cattle raising was the chief occupation. There were also located here a score of beekeepers, with many thousand colonies of bees. In favorable seasons good crops of honey were gathered from the huajillo, catclaw and mesquite, small trees and bushes. This honey is white and of fine body and flavor. There was the horsemint plant that produced a strong, amber honey. Cotton was not grown extensively in this locality and could not be termed a honey plant.

Beekeeping never interested me until the spring of 1911. Then I was taking an agricultural course at the Agricultural and Mechanical College. Prof. Wilmon Newell announced to all entomology students that he was going to organize a class for the study of beekeeping. I became interested and attended every class in beekeeping.

When vacation came I secured two colonies of bees and worried them to death by too many experiments and investigations. At the end of the season I had several empty beehives and a desire to become a real beekeeper.

The next year I bought 75 colonies of bees and secured a crop from some of them. In that land of extremes, a late, cold spell had injured the early blooming honey flora, while terrible rains held back later honey flows; then a cessation of rain for the rest of the year cut short the only flow that materialized. This is about the way the seasons continued to run for several years.

In 1914 a fair crop of honey was secured, but the market was ruined by a few honey producers who tried to unload all of their honey at once by cutting prices. A great deal of the 1914 crop was carried over to 1915. There was no spring crop, and much of this honey was used for bee feed. The winter of 1915-16 was extremely dry and prospects, from a beeman's viewpoint, were bad. However, in March the mesquite trees and bushes put out a heavy crop of buds and blooms and yielded a crop of fine white honey. The flow kept up for four weeks through hot and cold weather, also through showery weather. Most of the bees were not quite ready for the flow, but averaged about 50 pounds per colony. The beekeepers were agreeably surprised at this sudden flow from mesquite, as it is not a certain yielder of nectar in this section. Other honey flows did not materialize, but the dry weather continued. Bees went into winter with very little honey.

When the Spring of 1917 arrived the whole southwest section of the State was terribly dry. I had nearly three hundred colonies of bees that I had to feed early in the season. The lack of rain killed all chances of a flow from any of the many plants and shrubs. I made weekly visits to the apiaries and filled the outdoor feeders with syrup made of high-priced sugar.

It was in the early summer that three of the largest beekeepers left this dry country. B. M. Caraway and W. H. Laws each moved a car of bees to Wyoming. H. B. Murray moved to north Texas.

That fall I tried to feed the bees enough sugar syrup to carry them through the winter. The lack of pollen kept the bees from rearing brood, and they went into winter quarters weak. Two apiaries had stored a little honey in the broodnests and wintered fairly well. The balance came through in poor condition and many of them dwindled away. That spring we had a few very light showers that helped plant life considerably. I fed more syrup until the bees gathered honey enough

Bees loaded in freight car, ready to go.

to live on. Up to this time I had fed the bees 30 sacks of sugar.

"Distance lends enchantment" is no doubt a truthful saying when applied to beekeepers upon reading or hearing of good bee territory many miles away. It has always been a fascination to me to read of beekeepers harvesting fine crops of honey in the various parts of our country and some of the distant lands. The seasons I got fair crops of honey I would not take much interest in the distant bee territory. The poor seasons would always turn my thoughts to far-away localities where I knew good crops of honey had been secured. At such times I read a great deal of what successful beemen were doing in good localities and studied maps to see just where they were located. My constant dream was of a place where good crops could be expected every year. I was told that there were a few such locations. Dreaming of bettering our condition does little good until we set about making our dreams come true.

All winter I planned and dreamed of moving my bees to a locality where I could be sure of a crop every year. I wrote to nearly everyone that I thought could help me secure such a location. Letters came in reply to my inquiries, telling me of fine unoccupied territory in South Dakota, Wyoming and Nebraska. That spring Mr. Frank C. Pellett was touring Texas, making a study of beekeeping conditions and honey flora. I met him and asked him to tell me what he knew of the different territories under consideration. What he told me helped me in my determination to find a better place.

My time was short and money scarce, or I would have made a trip to look at a few of the places under consideration. I felt as though I would lose all my bees if I kept them in this country another year.

At last I decided to locate in northeast Nebraska. The Western Honey Producers, of Sioux City, Ia., had recommended a basswood-sweet-clover location in the Winnebago Indian Reservation.

While I was learning of bee territory I was also doing all I could to get my bees built up and in shape to move. A light flow of honey saved the day and I was able to rear good queens and increase my bees to 315 colonies. My hives were 10-frame and, in preparing the bees for shipment, I stapled on the bottom-boards and pushed seven combs to one side and nailed the outside comb to hold all combs in place. This allowed the bees a clustering space where the three combs were missing. A screen was nailed on and the cover put on and left until the bees were hauled to the railroad. Several of my beekeeper friends, who had experience in shipping cars of bees cautioned me not to ship heavy combs of honey in my colonies. They argued that heavy combs would most likely break down in moving and, as the bees would be on the road only a few days, little honey would be needed. To my sorrow I followed their advice.

First of all I hauled in all supers and supplies not in use, and last of all I hauled in the bees. The apiaries were located from ten to eighteen miles away. All the hauling was done with a Ford roadster with a truck body on it. Only small loads could be hauled and many trips were necessary.

E. R. Jones, bee inspector of Bee County, made a set of racks out of seven-eighths by one and one-half inch strips to fit in a stock car. These racks were very light in weight and allowed the hives to be pushed in between two racks, just as drawers slide into a wardrobe. This is the simplest, cheapest and best method that I know of. Mr. Jones had superintended the loading of four cars of bees and all went through without breaking down.

I started loading the car on Friday and put in and secured, in their places, supers, covers and other supplies; then the Ford. On Saturday the bees were put in. The car was not loaded in time to be picked up by the train it should have gone out on. The next morning was very warm and I filled my water barrel and then sprayed the car and bees, to cool them.

About 5 o'clock p. m., May 19, I was picked up by a northbound freight and started on my 1,200-mile journey to an unknown country. I supposed that I would be enroute five days, but did not arrive at my destination until 3 a. m., Sunday, May 26. I was supposed to be traveling on a fast freight, but it was too slow to carry bees on in warm weather.

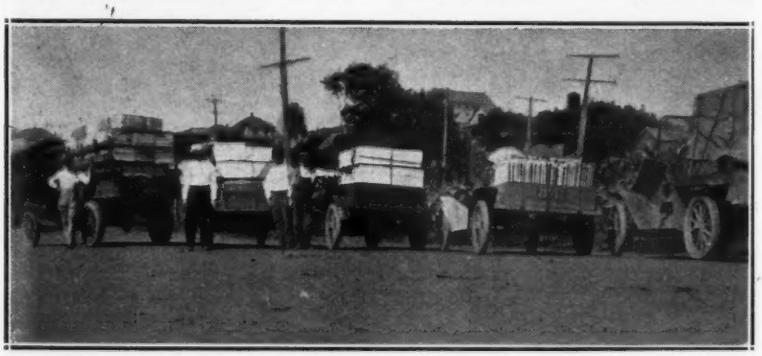
I made it a rule to get out of the car each time we came to the end of a run and hunt up the yardmaster and ask him to see that my car was not delayed in getting out of the yards on the next train. One time the train was going out without my car. I asked the different train crews to bump my car as little as possible, and explained to them that if the car was hit hard bees would probably get out and sting everybody. As a rule the car was handled carefully.

Several times each day I sprayed the bees and also threw water on the the car ceiling and floor to lower the temperature. I found that bees should have very little water sprayed over them at a time. A good deal of time was spent trying to keep the bees cool and watching for hives whose bottoms were worked loose. The staples that are listed in every bee supply catalog and sold to fasten bottom-boards to hives are not good for a long trip. The vibrating of the car kept working staples loose, while a few bottoms nailed on with 7-penny nails held. A hive with a loose bottom I had to slide out of the rack and re-nail.

The weather was not overly warm, but the bees were in a constant uproar on cool nights. When the car was stopped in a freight yard, in the sun, the bees became greatly excited. Wetting the car thoroughly helped quiet them. This continued excitement caused them to consume a great amount of stores. On the fifth day I found several colonies had starved, and about twenty starved by the time the trip was completed. The colonies averaged four combs of brood upon being loaded, but nearly every colony had eaten all of its combs of brood by the time they were unloaded. The few colonies that were heavy with honey came through in the best condition.

The bees were unloaded near the railroad at Winnebago and allowed to fly. I bought a sack of sugar and for several days fed each colony a little syrup through the top screen. As I arrived after dandelion and fruit bloom, no honey was coming in, and the bees had to be fed till the 10th of June.

A large tract of basswood timber, two miles east of town, was selected and the bees moved there. Upon going through the bees, I found nearly fifty queenless colonies, many of which had developed laying workers. These queenless colonies I united with queenright colonies. Had I ordered some queens and had them arrive a week later than I arrived, many colonies could have been saved. Most of the bees had worn themselves out in the excitement of being moved, and hardly enough bees remained to care for the new brood. I made every effort to get each colony ready for the honey flow, which local beekeepers said would start about June 20, from white sweet clover, to be followed by basswood early in July. These flows arrived on schedule time, but were preceded by a light flow from yellow sweet clover. The bees were not built up to strong colonies till basswood was through yielding nectar, and as most of the sweet clover was growing along the roadside and not cultivated, it soon went to



The bees loaded on trucks at the end of the long journey.

seed. Cool, wet weather prevailed during basswood bloom and the bees only had five good days in which to gather this honey. Dry weather followed and cut short the clover flow. If stock had been allowed to graze upon this clover, it would have bloomed much longer. The bees averaged 40 pounds of honey per colony, although many made much more.

If this small crop of honey had not been sold for 20 to 25 cents per pound my move would not have paid expenses. As it was, I did not feel jubilant over the outcome. I received letters from Texas that told of the continued drought and of many beekeepers who had lost large numbers of colonies. Many of the farmers had to have State aid in order to survive. This kept me from feeling that I had made a mistake in moving.

After the honey was extracted and sold, I built a 16x16x7 foot house to store all of the supplies in. During the summer I had slept in a tent and stored supplies under a large tarpaulin. A large cellar was next dug and made ready to winter the bees in. As some beekeeper friends agreed to put the bees away when winter really came, I made preparations to "Ford it" back to Texas.

I might say here that the Texas drought was broken by heavy rains that fall. Bees gathered more than enough honey for winter. Everyone looked for good seasons, which they have had since.

As I now look back over my experience in shipping this car of bees, I see where I made mistakes. At the time of preparing the bees and fixtures for shipment everything was done that I knew how to do to make the trip successful. I now realize that where bees are shipped in warm weather, with combs of brood and honey, they should be shipped in iced refrigerator cars , if on the road over two days. This would cause the bees to cluster and keep quiet. Many bees have been shipped successfully in refrigerator cars. At least 20 pounds of honey should be in each colony, and extra combs of honey carried to give the bees upon arrival, unless honey is known to be coming in and good weather prevailing. The bottom-boards should be nailed on with 7-penny nails instead of staples. A box car or a stock car is good to ship bees in, if shipped without brood, in cool weather.

In the spring of 1920 I wanted to ship about 200 colonies of bees from near Brownsville, Texas, to Sioux City, Iowa. The distance and high freight rates caused me to decide to ship three-frame nuclei in lightweight cages. I shipped strong nuclei with an average of one and a half combs of brood and from one comb to one and a half of honey. The bees were shipped by express and went through in from three to four days' time. One nucleus was smashed by the express company and was the only one lost in transit. The bees were given combs of honey upon arrival and built up to strong colonies by July. They averaged 120 pounds per colony, besides honey for winter and spring use. Each colony drew out an average of 25 Langstroth combs. From the outcome of this shipment, I am led to believe that it is cheaper to sell all bee supplies and ship the bees as nuclei by express if they are to go any great distance. Supplies would have to be prepared for the nuclei in advance. If 300 colonies or more are to be shipped to arrive at the beginning of the honey flow, they should be strong colonies and go through in a refrigerator car. This will enable them to be in honey gathering strength when placed in the new location.

Iowa.

DZIERZON LETTER

We are indebted to Editor Alfonsus, of the Vienna "Bienenvater," for an autograph, signed letter, from the world-renowned Dzierzon, discoverer of parthenogenesis in bees. We are also indebted to C. W. Aeppler, of Wisconsin, for a translation of this letter. We give the letter below. Our readers will notice that Dr. Dzierzon praises his own hive. No one who has used the Langstroth principles of free-hanging frames can for a moment contemplate accepting the bar hive of Dzierzon. But a father is sure to love his son best, and we can only look indulgently upon Dr. Dzierzon's preference, and admire his wonderful experiments and discoveries with so inconvenient an implement.

The letter is without date, but it must have been written some 40 years ago, if we judge by the yellowness of the paper and the faded appearance of the ink. Dr. Dzierzon has been dead 15 years.

The Dzierzon Hive

By Dr. Dzierzon

The most practical and at the same time the cheapest movable-comb hive is without a doubt my twin hive. Many will imagine in this new home for bees something very elaborate and costly, while as a matter of fact it is simplicity itself, and through this simplicity I see only the greatest possibilities for the future. Its practicability will be substantiated by its many good points, of which I will tell in future articles, but for the present will describe its manufacture, which also goes to show how simple it really is. I believe that I can do this most clearly by comparing it with some other good movable-comb hives.

At the time that I was pursuing my university studies at Breslau, my attention was called to an article in bee literature by one of my colleagues who was also an interested beekeeper; this article arousing my keen interest. The work of the Englishman, Stutt, was announced, who had patented a hive that was claimed to give a surplus of 100 pounds of honey in a single season. Immediately a sample was purchased. The Stutt hive was quite practical. It consisted of a large box in which was a compartment for the brood and the wintering of the colony, and two compartments half as big on the gable sides. This must be called quite practical, since on either side of the brood-chamber is a convenient place to have the extracting combs. But the price of this hive was enormous, more than twice as much as my twin hive. One twin hive will entirely replace two Stutt hives, the latter consisting of 6 pieces. Each of the two compartments furnish in the center the brood-nest, which usually consists of 8 combs, and on either side the surplus compartments in which there are 4 combs each, or together there are 16 combs. These furnish an inner depth of 60 centimeters. The twin hive, however, on account of its mobility, stands forth as a practical home for bees—something that one cannot have if he uses a house-apiary. Four pieces of plank or two pieces of lumber ordinarily used for sills will make 3 or 4 twin hives ready for use, the only other thing needed being the cover, which consists of tin properly shaped and fastened. On account of the unobstructed daylight, and the unlimited room for a hive-stand in using this hive, it is a real pleasure to work with the bees, whereas in a dark house-apiary it is a veritable torture. He who adheres to the use of house-apiaries, which the Americans do not recognize, will never accomplish very much in beekeeping. My motto has, therefore, always been do away with house-apiaries!

Dr. Dzierzon.

FIR SUGAR AGAIN

I was very glad, indeed, to see the photograph of fir sugar in the last number of the American Bee Journal. I have just read Davidson's note and should like to call attention to one or two of his remarks. I am unable to say positively without further information whether the sweet substance gathered at Victoria was an excretion of Homoptera or of the leaves of conifers. The beekeeper, however, states that it was gathered mainly from the Douglas fir, chiefly from isolated trees; it was stored in mid-summer, the dryest and hottest time of the year; and the "honey" seems to have been similar to that stored from the Douglas fir. There certainly seems reason for thinking that it may have been an exudation of this tree. It is not altogether safe to lay down too rigid rules for the behavior of either plants or animals. Manifestly it would be an absurdity to imagine that the substance was a resin, since bees would not gather two or three supers of it in sections and cap it over, neither would it have a fair flavor.

I fully agree that fir sugar should not be called honeydew. I would restrict the use of this word to the sweet exudations of insects gathered by honeybees.

Maine. John H. Lovell.

"It is really disgraceful for such a country as ours to import wax or honey. We ought ourselves to export thousands of tons of each every year." (American Bee Journal, December, 1871.)

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THE EDITORS' VIEWPOINTS

Belgium Appreciates

As an evidence that the Belgian Government appreciates the modest efforts made by our beekeepers to help the French and Belgian suffering beekeepers, our editor was awarded the "Order of the Crown of Belgium" by King Albert. While thankful for this honor, he realizes the fact that this recompense was earned by the concerted action of the numerous subscribers who sent their share of the Good Samaritan fund since October 1919. Each of you, friends, is therefore entitled to a share of the credit.

Good Samaritan Fund

Statement April, 1921	$17.00
E. M. Cole, Audubon, Iowa	1.00
Total of last subscription	$18.00

This last amount was forwarded, as before, one-third to Belgium, two-thirds to France, on May 5. The amounts were 74 francs to Belgium and 149 francs to France, the remittance having been purch ed before the rise in value of the francs. In a few months we will be able to give a statement from the committee in charge. The totals sent by us were all published in the American Bee Journal from time to time.

Too Much Pollen

The May number of the Swiss "Bulletin de la Societe Romande" contains an article by Jules Comtat, complaining of too much pollen in the hives in the spring, some colonies filling two and three combs, especially if empty combs are given them to increase the breeding space. We have often seen too much pollen in queenless colonies, but never in queenright colonies when they are breeding heavily. This must be a question of locality.

His remedy is to place the combs of pollen in a tub of water, held down with a weight, for two days, then wash the pollen out with a spray pump and put the combs in the air to dry.

Unfair Discrimination

In the May number of the Western Honeybee, F. W. Redfield calls attention to the fact that market quotations do not deal fairly with honey of similar quality from different sections. He mentions especially the white alfalfa honey of the Rocky Mountain region, which is light in color and of good quality, but which is quoted at prices similar to Hawaiian and Imperial Valley honey of inferior quality.

There is no apparent reason why such a difference in price should prevail as market quotations indicate. Southern beekeepers make similar complaint, stating that their white honey, which is equal in quality to the best, is quoted on a basis little if any above the dark and poor quality produced in the same region.

We suggest that right here is an opportunity for the National Honey Producers 'League to render a real service to beekeepers living in regions where discrimination is the rule.

Drone-Laying Queens

Huber ascertained that the queens who become drone-layers, whether superannuated, or rendered drone-producing through retarded impregnation, never take offense at the building of queen-cells. He tells, in his Twelfth Letter, of experiments made upon such queens, and also upon queens which have been deprived of one or both of their antennæ. The removal of one antenna, from either queen or worker, has no ill influence upon them; but if they are deprived of both, they become absolutely worthless and incapable of doing anything. Probably no observer has made as many experiments upon this subject as Huber did.

It is a strange fact that a drone-laying queen will pay less attention to queen-cells or young queens than even a virgin, for the first thing that a virgin queen does, when she emerges from her cell, is to seek other queens, whether in the royal cells or at liberty, and try to kill them.

The fact that a colony will rear a queen, when the old mother is still alive in the hive, and that the young queen will become fertile and will lay eggs, sometimes for several months, while the old queen is still present, indicates that a fertile queen pays, also, little, if any attention to a superannuated queen. But how do they know whether their rival is or is not a drone-layer?

Imports and Exports of Honey

It is not a bad plan to see ourselves once in a while from the viewpoint of others. It is also desirable that we should understand that others are suffering from the very troubles which we notice in our own selves. Lack of union, lack of understanding, and especially international ill will, are causes of depression in prices. The following report, abridged from an Italian statement, shows us for the first time a fair statement concerning United States honey. When it comes to commerce, each country seems to consider all other countries as enemies

An Italian Statement Concerning Honey Imports and Exports

The market of honey, which ought to be regulated in a modern way by the Bee Associations, is constantly in the position of an interrogation point, the avidity of the producers and the want of precise information are the causes of the prevention of the regularity of the market.

The statistics of the Ministry of Finances illustrates the movements of Italian exports and imports of honey in the nine years from 1911 to 1920.

	Imports	Exports
1911—Quintals	1037	2825
1912—Quintals	1152	2090
1913—Quintals	2120	3070
1914—Quintals	743	2868
1915—Quintals	228	6944
1916—Quintals	741	325
1917—Quintals	11822	17
1918—Quintals	12877	49
1919—Quintals	1284	19

It will be noticed that, while the average of importation of honey annually, previous to the war, was about 1,000 quintals, during the years 1917-18 it was about 12,000 quintals.

We have now returned to the annual average of importation of 1,200 quintals. But it is to be noted that, while before the war Germany was the principal country which supplied us, now the first place is held by North America, especially by the United States, where beekeeping has taken great development. Neither is it correct to say that that country produces only inferior grades of honey; it also produces table honey of the very best quality, for direct home consumption.

The Little Bees

This is not beekeeping, but it is entitled to a place, gratis, almost anywhere:

Les Petites Abeilles (The little bees), under the patronage of Princess Marie-Jose, of Belgium, announces that, in a few days, they will inaugurate their Sanatorium for rachitic children of 16 months to 6 years, at their country seat of La Chise a Pietrebais, Brabant, Belgium, and they hope that notice will be taken of this by charitable people who will take to heart the co-operation for the cure of rachitic childhood. Gifts of any kind will be welcome, at the Sanatorium Des Petites Abeilles, at the above address.

Translations of Huber

Most of our beekeepers know what an immortal observer Francis Huber was and how much his writings enriched the bee literature of a hundred years ago. I. have his work, "New Observations," in the original French. Lately I secured the translation which was published in England in 1821. Wishing to ascertain how correct this translation is, I compared the two and found, to my great astonishment, that the 1821 edition of the translation, by an anonymous translator, does not contain more than two-thirds of the contents of the original 1814 edition. It also contains gross errors.

Since then, I secured, for perusal, another English translation, that of 1841, which advertises itself as follows: "The text has been carefully revised and rendered more agreeable to the English idiom than that of former translations." In reality it is a servile copy of the 1821 edition, with the same errors, even including an error by the printer, who had put the words "strange hive" when "strong hive" was meant. The English editions give but 5 plates, while the Swiss edition contains 12 plates.

So, after all, the English and American readers of Huber have had but truncated editions of the admirable work.—C. P. D.

Utah Honey Producers

Utah has fallen into line and is keeping step with other wide-awake honey-producing States in the march of progress for better methods of marketing honey and buying supplies. A meeting called by the Utah Beekeepers' Association was recently held at Price, and an organization perfected to be known as the Utah Honey Producers' Association. It is a non-profit, co-operative organization for the purpose of marketing the products of the beekeeper and buying supplies collectively. Bids on cans were submitted and an order has already been placed for 24,000 five-gallon cans, one carload of five and ten-pound friction top pails and two carloads of cases, at a considerable saving to the beekeepers of the State. The order for five-gallon or 60-pound cans will, in all probability, be increased to 40,000 before extracting time. It is the intention to do something in the way of marketing honey collectively this fall.

The board of directors elected to serve until the first regular meeting are Thos. Chantry, of Wellington, who represents the beekeepers' interests on the State Board of Agriculture; M. J. Stewart and C. T. Beggs, of Myton; Wm. McKenzie, of Ferron; Andrew Vernon, of Vernal; Wilford Belliston, of Nephi, and R. T. Rhees, of Ogden. The office and storehouse of the new association will be at Salt Lake City, and C. T. Beggs will attend to the business and act as secretary until the first regular meeting. A constitution was adopted similar to that of the California Exchange.

The outlook at the present time is very good for a big crop of honey for 1921.

Dan H. Hillman, State Inspector.

A Live County Organization

Vigo County beekeepers are people who believe in upholding the reputation of the State of Indiana and, besides, doing a work which is a benefit and monument to themselves and furnishes the example for better beekeepers.

They have recently finished a five-day field trip which took in all of their county and parts of Park, Clay and Sullivan Counties besides. Stops were made at the apiaries of seventy beekeepers, little and big, during the five days.

Nor have their past and present efforts been in vain, for the county is now practically free of foulbrood and has scarcely any box-hive beekeepers left. The persuasive effect of a group of up-to-date beekeepers meeting in the yard of a more lenient member of the profession more often than not has the desired effect. He is likely changed to the ranks of the progressives.

W. A. Hunter, the efficient President of the association, had the trip in charge.

Truth in Honey—Truth in Wool

Congress is now considering the French-Capper "Truth in Wool" bill, making it imperative that the manufacturers of fabrics label all materials made as to the ingredients, whether all wool, what per cent shoddy, etc.

The bill has the backing of all wool growers, of all the large tailoring establishments and associations, as well as of many independent organizations. Truly, is there any reason why we should not know the makeup of our clothing as well as the content of our jelly glass or honey bucket. The bill should go through.

Many Scrubs Are Ousted

According to the latest report, the project leader, sixteen Missouri counties have replaced a total of 156 scrub bulls with purebred sires since January 1. A good hint for every good beekeeper to pinch off the head of that worthless queen today and replace her with something which will at least earn its way.

Unscrupulous Beekeepers?—Unscrupulous Newspapers

In its issue of Tuesday, May 24, the Philadelphia Evening Ledger criticises a bulletin sent out by the State Department at Harrisburg advising farmers to feed their bees on account of the lack of bloom caused by frost.

The Ledger comments in a semi-humorous vein, coupled with the usual number of mis-statements, among which is the one that beekeepers are sometimes unscrupulous and feed to their bees a syrup made of half glucose and half honey. They suggest, also, corn meal and sweet puddings.

We have protested to the editors of the Ledger, who are located in Philadelphia.

Field Meets in Iowa

The editor attended field meets in Iowa, June 2 and 3. On June 2 there was a forenoon meeting at the apiary of Mr. P. Mohr, the happy father of 13 children shown on page 139 of our April number. An open air dinner was enjoyed by some 30 beekeepers, with discussions and apiary visits. In the afternoon the meeting was held some 3 miles further, at the apiary of W. W. Myers, an old beekeeper who once lost all his bees by foulbrood, but who picked up courage and now has some 60 healthy colonies and good prospects. Later the editor and Mr. Atkins enjoyed a visit at the Academy of Sciences, of which Mr. Paarman is Curator. It would take pages to describe this. Mr. Paarman, who is an enthusiast, had also arranged a banquet for the beekeepers for the same evening. So the day was well filled.

On the 3rd, an afternoon meeting was held at Muscatine, on the porch of Mr. H. C. Klaffenbach. The editor must acknowledge the charming hospitality of this gentleman's pretty wife, who served an excellent dinner in honor of the two guests from away, Mr. Atkins and himself. At this meeting a very interesting and unusual display was made by Mr. H. W. Clark, of the Fairport fisheries. It consisted of about an ounce of pollen, gathered by hand, upon the cattail blossoms (**Typha**) of the fish ponds managed by the Government.

We owe thanks to the County Agents of both these places for arranging the meetings and helping to make them successful.

The C. C. Miller Fund

It is still time for subscriptions to the Miller fund, for we will have to put off the publication of the list till we get everything together. So we trust the other American magazines who have taken the matter in hand will send us their list at once. There is one list, at least, in Europe, but it may be added later. We will expect the "big guns" of the business to help round up the sum. It will not be too large, at best, but Dr. Miller would be pleased, anyhow, if he could see the effort made.

Blue Melilot

In our May number, page 195, we spoke of "Melilotus cærulea Pers" (blue melilot), described by Bonnier as grown in Europe as an ornamental plant, and asked our foreign readers for seed of it. We acknowledge with thanks the receipt of a little package of this seed from Mr. A. Zeier, of Lyons, France. We will try it next spring and report, in these columns, in regard to it.

Dr. C. C. Miller

On June 12th, the Presbyterian Sunday school of Marengo unveiled a large picture of Dr. Miller, with very beautiful exercises. A former scholar of Dr. Miller, Judge E. D. Shurtleff, gave the principal address. I should like to give you a copy of his speech, but he did not have it written. Mrs. C. C. Miller.

June 13. Marengo, Ill.

CONTROL OF THE WAXMOTH

Notes on Fumigation of Combs to Prevent Destruction When Not in the Care of the Bees

By G. H. Cale

Beemoths are most effective destroyers of honeycomb, and it requires care to protect combs, which are not in use, from injury. It is interesting to note that the larvæ of the moths prefer to feed on pollen and on the cast skins and debris left in the cells of the brood-combs, a habit which directs them to the most valuable part of the colony equipment.

Paddock shows (Bulletin 128, Texas Agricultural Experiment Station, "The Beemoth or Wax Worm") that temperature greatly influences the life history of the larger beemoth (**Galleria mellonella**), and the greatest number of generations occur in the South, where the summers are longer and the mercury stays higher on the scale. At least three broods develop annually at College Station, Texas. Some beekeepers in the South report large losses of colonies, due to moth injury, but much of this loss may come after the colonies are weakened from other causes. Where conditions are so favorable for development, greater watchfulness is obviously necessary. In the North, the average life history is longer and at best there are probably seldom more than two generations a summer, although when the summers are especially long and hot, the chance of added generations increases.

Natural Enemies

The most effective natural enemy of the beemoth is the honeybee itself. It is an axiom that strong colonies of bees will rarely tolerate the presence of moths, but when the bees are not sufficiently numerous to care for all the combs the moths may then infest unoccupied areas. Some races of bees, however, show less of a disposition to rid the hives of intruders than others. It is characteristic of good Italians to clean house thoroughly, and the use of strong colonies of Italian bees is now considered a necessity in the control of European foulbrood. Their value is still further emphasized in the control of the beemoth, since there is no better insurance against the loss of combs from moths than to leave them as long as possible in the care of such colonies.

Moths and moth larvæ are both quickly killed by freezing temperatures, and in the fall, in the North, when the temperature becomes low enough, there is no further danger of moth injury. It is usually sufficient to stack the supers or hives of combs away, tightly covered, until again needed, but where zero temperatures do not occur, some of the moth eggs, at least, will probably live over winter to hatch in the spring. In the South, although the temperatures may be sufficiently low to kill the moths if they are exposed in different stages of their life history, the more protected ones will escape and remain as a constant source of injury.

Carbon Bisulphide

The most effective control for moths, when combs are not in use and the temperature is favorable for development, is the ordinary practice of fumigation. The usual carbon bisulphide, or "high life," is efficient in its action, and readily obtained. It is purchased as a liquid, but when exposed to the air it volatilizes rapidly as a gas, about two and one-half times heavier than air, which settles rapidly to the lowest possible level. This gas is dangerously inflammable when mixed with air, and often explosive. It is not poisonous, as frequently supposed, but kills by suffocation, and honey with which it comes in contact is perfectly safe to use. The action of the gas is most effective when the temperature is sufficiently high to allow rapid evaporation of the liquid and it is therefore obviously most effective in warm weather, which is also the time when moths are the most active.

Combs to be treated may be left in hives or supers and the latter piled in stacks. To prevent the escape of gas, the bottom body should be set in an inverted hive cover on a newspaper so arranged that a tight joint is made. The edges of the hives should be scraped to remove propolis and other adhering materials, and the remaining spaces due to unevenness may be closed easily with refuse wax, or with mud. A measured amount of carbon bisulphide is poured in a dish set on the frames of the top hive. A large, flat dish is preferable, since it exposes a considerable amount of the liquid to evaporation. An empty hive or super, set about the fumigant and covered tightly, completes the operation. If care is used, the gas may be confined for a long time.

Carbon bisulphide is placed in a shallow pan in an empty super above the combs.

Paddock found that the moths were killed by carbon bisulphide in 15 to 20 minutes, but that pupae and protected larvæ required a period of some length. With the dosage he used the eggs were not killed. Heavy doses will probably kill the eggs, but it is not generally considered practical or economical to use large amounts of the fumigant. The usual incubation period of the egg is 7 to 9½ days, and the newly hatched larvæ do little damage until they reach the midribs of the combs, which requires a minimum of about four days. A second examination at the end of ten days or two weeks, therefore, will show what combs need a second dose. A third fumigation is not necessary as long as the stacks remain tight.

Amounts to Use

The following are approximately the amounts of the bisulphide recommended by Paddock:

For 10-frame Langstroth hives—1 ounce to each 3 hive-bodies.

For 10-frame shallow supers—1 ounce for 5 supers and one-quarter ounce additional for each super thereafter.

For large hives, such as the Dadant or Jumbo, one-half ounce is sufficient for each hive-body. Where 6-inch extracting supers are used, two supers are equivalent to one large hive. Since these amounts supply gas sufficient for the space inside the stack, the empty protecting hive-body or super on top is included in the count.

Sulphur

Sulphur, or flowers of sulphur, is sometimes used as a fumigant, but it is not as effective as the bisulphide. In this case the material comes in lumps, or as a powder, which is burned, forming a suffocating gas, sulphur dioxide. The sulphur must be burned at a high temperature to be most effective, and the better protected forms of the moth requires exposure to large amounts of the gas for a considerable time before death occurs. The gas is most effective in the first five or six hours, and the fumigation is practically complete in ten to twelve hours. The eggs are not affected.

Since the gas is considerably lighter than air, it rises as far as possible, and the sulphur must therefore be placed beneath the combs which are to be fumigated. The stacks should be as tight as for the bisulphide treatment and the dish containing the sulphur may be set in an empty body at the bottom. The sulphur may be burned by putting it in a dish that is not held together with solder and setting the dish on a brick or a pan of cold ashes to prevent burning the floor. Sulphur is cheaper than bisulphide, and it is not necessary to economize in its use. In fact better results are obtained by using excessive doses. Sanitary entomologists have a standard of 4 pounds to 1,000 cubic feet, where the enclosure is not air tight. Figuring this down

to the beehive, one and one-half ounces of sulphur will be sufficient for each tier of ten hives. Sulphur in proper amounts may also be burned in a room which is tightly closed and the hives of combs well exposed to the fumes.

Paradichlorobenzene

This strange looking language names a chemical which is coming into prominence as a fumigant and promises to be effective against the beemoth. The gas given off is heavy and non-poisonous and is not inflammable, which makes it 100 per cent safe. It is obtained in flakes similar to naphthalene flakes, and is used in the same way as bisulphide.

Carbon Tetrachloride

This chemical is also a liquid which quickly evaporates as a heavy, suffocating gas and is sometimes recommended as a fumigant. However, it is not effective against the beemoth. L. R. Watson, of Texas, who is a good chemist, experimented with it to some extent, but was unable to kill the moths in the usual confinement of tiered hives, even with large doses of the gas. The gas is considerably heavier than carbon bisulphide and, while it tends to suffocate the moths, and probably does kill many larvæ and pupæ, the higher levels of air are so free from it that the adult moths collect in the upper parts of the tiers and thus escape injury. Large quantities of the gas, used in an absolutely air-tight space, might be effective, but this would probably require amounts of the tetrachloride, which would make the process more expensive than the use of bisulphide.

Hydrocyanic Acid.

The most effective of all fumigants is produced when potassium cyanide reacts with sulphuric acid to form hydrocyanic acid gas, and there is no doubt of its ability to kill beemoths in all stages almost at once. Unfortunately, however, every other form of life that breathes it is also killed, and only a chemist or a fumigant expert should handle it. It has a prominent use against insect pests of many plants, but requires tight containers to prevent the escape of the gas.

It is interesting to learn that one of the chemists of the United States Department of Agriculture tested its use with combs of honey and found that when four ounces of cyanide were used to 100 cubic feet of space, a dose four times greater than that given dormant nursery stock, sealed honey absorbed none of the gas. Uncapped honey absorbed about 21 parts of the gas per million, but after exposure to the air for 24 hours there were only 2.4 parts per million remaining. After standing for two days the uncapped honey was safe for consumption.

A SUBSTITUTE FOR ROYAL JELLY

By J. A. Nininger

Those who have reared queens realize how difficult it is at times to secure royal jelly. It has been a question in my mind whether the larvæ deposited on such small quantities of jelly find proper nourishment at the start. I have adopted a simpler method and one which, according to my experience, gives as good results, if not better.

I prepare the cell cups as usual, but instead of putting a bit of royal jelly in each cell, I put in a drop of honey from a comb filled with unripened nectar. For this purpose I use a match or toothpick. Any small stick will serve.

For grafting, I select a comb with larvæ of the desired age and shave it down to a very shallow depth. Larvæ from 12 to 24 hours old are selected.

I have found this method so simple and satisfactory that I have abandoned the use of royal jelly altogether.

Kansas.

DISCOVERY OF THE ACARINE MITE

An Account of the Investigations relating to Isle-of-Wight Disease

By P. Bruce White, B. Sc.

In the opening years of the present century a serious epidemic disease of bees broke out in this country. The earlier outbreaks were probably restricted to the south of England, but the disease is now disseminated throughout the length and breadth of the isles and has become the most serious of the pests with which the British beekeeper has to cope. As the disease was first recognized and examined in the Isle of Wight, it has come to be known "faute de mieux," as "Isle-of-Wight" disease.

The disease is characterized both by the symptoms of the individual bee and by the disorganization of the communal life of the hive.

The onset of the disease in a stock may be marked by various premonitory symptoms. The foraging bees, leaving and returning to the hive, may show a certain listlessness, lingering before the hive. Presently the first crawlers appear, bees which, incapable of flight, crawl aimlessly on the ground. As the disease progresses the number of crawlers increases, and on warm days hundreds of stricken bees may be seen before the hive. The disease may run a varying course; it may progress steadily till the depleted and disorganized stock perishes or may wax and wane, often showing signs of periodicity. In badly affected stocks the routine of the hive is upset, foraging is half-hearted, the hive becomes soiled with feces, the brood may be neglected, and the bees no longer withstand robbers, which enter with impunity. It is seldom, if ever, that a diseased stock survives the winter.

Fumigating combs in a tight stack of hive-bodies.

The stricken bee falling to the ground in its attempt to fly from the hive may, for a short time, perform a series of short flights, a few feet in length, but eventually it takes to crawling. In some cases there is dislocation of the wings; in others there is dragging of the legs. Death is probably due to cold and starvation. The abdomen is usually found distended by an accumulation of fæces in the intestine, which is filled to the limit of its capacity.

In 1907 Imms reported on the disease, but made no suggestion as to its cause. He laid stress upon the intestinal symptoms. His work was followed up by Malden, who was of the opinion that the site of the primary disease was in the chyle stomach, and suggested that an organism, called by him bacillus pestiformis apis, was the causal organism. In 1912 Fantham & Porter held that the disease was due to the microsporidian parasite, Nosema apis, mainly attacking the chyle stomach. This view quickly gained acceptance and "Isle-of-Wight" disease was considered identical with "Bee microsporidiosis" and "Nosema disease." Later this theory was called in question by Anderson, of Aberdeen, and then by Anderson and Rennie. Following up this work, Rennie and Harvey showed the existence of two distinct diseases of the bees, Nosema disease and Isle-of-Wight disease, each having its own symptom-complex.

A special joint committee of the University and College of Agriculture of Aberdeen was formed and with funds provided by A. H. E. Wood, Esq., of Glassel, Aberdeenshire and the Development Commissioners, the search for the cause of Isle-of-Wight disease was renewed under the direction of Dr. Rennie, of the Parasitology Department of the University of Aberdeen.

In June, 1919, the writer joined the research to attack the problem on the bacteriological side in Professor Shannon's Pathological Department.

An interesting excursion was first made into the normal bacteriology of the bee which brought to light some interesting facts in the bacterial binomics of its intestine. The bacteriology of Isle-of-Wight bees was then taken up, but after much work no clue as to the causation of the disease was forthcoming.

In May, 1920, however, the writer,

while examining atrophied muscle fibres from the thorax of a diseased bee noted a number of oval bodies within a fragment of a tracheal tube included in the same preparation. These bodies proved to be acarine larvæ.

Examination of the thoracic tracheæ of other crawling bees showed certain of the major tracheæ to be extensively obstructed by mites in all stages of development, from ova to adult forms.

An examination was made of 150 bees from several diseased stocks and the parasite was found in every case. One hundred apparently healthy bees from apparently healthy stocks were also examined and the parasites were absent in 95 per cent.

With these data to hand, the writer reported his observations to his colleagues and advanced the theory that this parasite was the cause of Isle-of-Wight disease.

At the same time he learned that a solitary mite had been seen in the trachea of an apparently normal bee by Dr. Rennie and Miss Harvey in the previous December, but no causal relationship was then suspected.

Dr. Rennie, Miss Harvey and the writer then commenced a routine examination of a large number of diseased and healthy stocks involving the examination of upwards of 3,000 individual bees.

The results of this work may be summarized as follows:

1. The mites were found present in every stock exhibiting symptoms of the disease, and in every crawling bee.

2. The mites were absent in the great majority of apparently healthy bees from apparently healthy stocks (approx. 80-90 per cent of those examined between May and October, 1920).

3. In approximately 35 per cent of seemingly healthy stocks derived from the British Isles, a varying, although usually low, percentage of infection was present. A number of these stocks kept under observation later developed the disease.

4. No mites were discovered in samples of bees sent from the Continent.

The results, therefore, strongly support the view that the mites are a "sine qua non" of the disease.

Dr. Rennie, after a systematic study of the parasite, has relegated it to the genus Tarsonemus, giving it the specific name, T. Woodi (nova spec.) in token of gratitude for the interest and support of Mr. Wood throughout the investigation. Dr. Rennie has further made progress with the study of the life history of the mite.

The writer took up the pathology of the disease.

The parasites were found to enter the bee through one or both of the first pair of spiracular orifices and apparently through these alone. They remain located in the system of major tracheæ and air sacs of the anterior moiety of the thorax and in the vessels of the head—these latter being less frequently invaded. No mites have been found in the respiratory system of the abdomen.

In the earlier stages of the attack the microscope reveals the almost colorless ova and embryos lying within the lumen of the otherwise normal trachea. The parent mites may usually be found in their vicinity.

As development proceeds, the tracheal lumen becomes markedly obstructed and the wall becomes encrusted and bronzed with fæcal deposits. In the later stages this color generally deepens to black.

The affected tracheæ now appear deep brown or black to the eye. They have lost their elasticity and have become hard and brittle. This is the condition found in the majority of bees crawling from the disease.

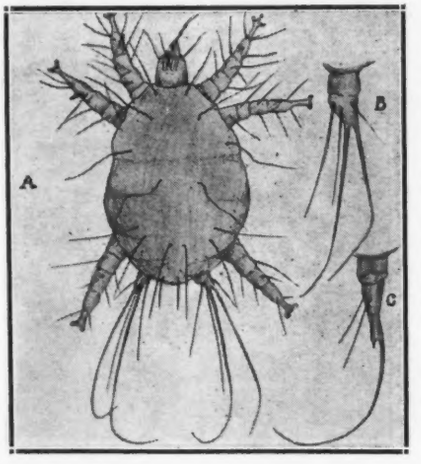
In a high percentage of Isle-of-Wight "crawlers" atrophic changes of the thoracic muscles of flight occur. As a rule only a few fibres show marked changes. The affected fibres are white, thread-like and brittle, thus contrasting with the flaccid greyish-yellow normal fibres. There is advanced wastage of the fibrillar substance, loss of fluid and condensation of the granules of the fibre. The atrophied fibres are frequently reduced to one-half the normal width during relaxation. It seems probable that such fibres are dead; they are certainly functionless.

Occasionally the black spots develop in the muscle fibres of infected bees, but their causation is not yet definitely elucidated.

The examination of the alimentary and other systems has revealed no other characteristic lesion associated with the disease.

The primary effect of the mites upon the bee has a double aspect. The parasite living and developing at the expense of the body fluids of the bee must threaten nutrition. Possibly, too, they are actually venomous. The actual importance of this active injury is, however, a matter of surprise.

In the second place, there is the partial or complete obstruction of certain of the thoracic tracheæ by the parasites and their products. The importance of this passive factor is much more readily estimated. In the great majority of crawling bees the effective lumina of certain major thoracic tracheæ are reduced to the lacunæ between the closely packed parasites and the air which filters through must be depleted of oxygen by the mites themselves. The organs which are supplied by such tracheæ must suffer from oxygen starvation.



A. The acarine mite. B. Fourth leg of female. C. Fourth leg of male.

Among the organs of which the respiratory exchange is thus endangered are the thoracic muscles of flight and the cerebral ganglia.

With this in view, a series of controlled experiments were made upon normal bees in which one or both of the first pair of spiracles had been closed with wax. A condition of crawling closely simulating Isle-of-Wight disease was produced, and in a few days muscle atrophy identical with that found in diseased bees appeared in many cases.

These experiments support the view that mechanical blocking of the tracheæ is a factor of great importance—perhaps capable in itself of occasioning all the symptoms by which we are wont to recognize the disease.

Through the impairment of the respiratory exchange of the thoracic musculature and the cerebral centers the power of flight is lost, and with loss of flight a series of secondary conditions arise. The fæces, normally voided on the wing, are retained and accumulate, compressing the abdominal air sacs—another blow at the respiratory function.

It is probable that toxins are absorbed from the stagnant gut and that excretory stasis in the Malpighian tubules is reflected back upon the body of the bee.

Once the flightless bee leaves the hive, unable to return, it perishes from cold and starvation. Should it remain it is faced with the condition of functional stagnation which cannot be infinitely maintained.

It is impossible in this condensed paper to touch on several important matters, as for instance the transmission of the disease and its seemingly insular distribution. Certain details have been omitted, together with such matters as the special characteristics and life history of the parasite, of which others can speak with greater authority than the writer.

It would now seem advisable to replace the rather meaningless term Isle-of-Wight disease by the term "Acarine" (or mite) disease. This is not likely to lead to confusion for, though several species of mite are known to occur on bees, T. woodi alone appears to be associated with pathological phenomena.

Scotland.

PEDDLING HONEY

By Patrick J. Murphy

Interesting indeed is the article in the January issue, from Mr. Wesley Foster, concerning marketing of honey and the profits taken by honey peddlers.

The producer forgets that the percentage of profit that the average vender of honey takes is less by far

than that of the retail merchant. I am speaking of averages.

The consuming public get their honey at a lower price from the house-to-house honey peddler than the same thing can be secured from the average grocer. The reason for this is that the vender generally uses the kind of containers that the grocer would not accept. Then, again, the housewife who buys from the grocer a tiny glass of honey and pays perhaps 25 cents, will take two or three times as much honey from the honey peddler at a less price. The honey peddler centralizes his energy upon the one item—honey—and usually, if he makes a sale at all, it is more than Mrs. Housewife buys from her grocer.

I have found that the great trouble is, there are not enough peddlers. Moreover, there is a decided scarcity of **good** honey peddlers. Men who have salesmanship to any great degree generally get into something more lucrative than the peddling of honey. It is an exceedingly interesting line, just the same. Really, it's a pity that more men do not avail themselves of the opportunity offered in the sale of extracted honey from house to house.

It's a burning shame that the public is so ignorant of honey.

Many still believe that honey is manufactured to some degree.

If ever a commodity needed advertising , it is honey; yet it is the most difficult food product to bring to the attention of the American public.

The Chinese herb doctors, so generally known in the west, use a great deal of honey in compounding their herbs, of which they make claim to numerous cure-alls. Whether or not there are any real cures in their concoctions, these Oriental medicine men seem to think so.

Anybody with a little business sense can get into the honey business, at least in a small way.A good way is to select some place on the highway where motorists are passing. It's in the average person to want to buy any food product in the country. They like to do it. Simply put honey up in jars, bottles or pails and stick up a sign with the word "HONEY" on it, and you will find people will stop and be glad to purchase. It is well to select some wide portion of the highway, so that parties who stop to purchase do not block the way.

One man I know, who has sold honey for years, and who is a success as a vender, has one kind of dark honey that he sells as "wild honey." He has a class of trade who want to buy the wild product, and he does his best to satisfy them. Whether or not this is a wise thing to do, I cannot say; however, all honey is more or less wild, so to speak.

As honey seeks a lower market level than it has during the last few years, the sales will increase, beyond doubt; yet we must all bear in mind that every little bit of advertising we can give any honey is good propaganda.

And do not begrudge the other fellow a profit, for, as Mr. Wesley Foster says, "The honey peddler is doing a missionary work."

California.

ECONOMY IN THE PRODUCTION OF QUEENS

Part III.—A Stock Hive for Supporting Baby Nuclei

By George D. Shafer

For years Mr. Wing mated queens from twin nuclei made by separating the standard 8-frame hive into two equal parts by a tight lengthwise division board, using two or three Hoffman frames in each nucleus. He tried smaller frames, too, however, and gradually began to gain experience with baby nuclei.

In "Simplified Queen Rearing" Mr. Pratt has a paragraph in which he mentions special chambers (holding sixteen small combs stocked with a full colony and used "for the purpose of securing brood and honey in small frames." Following the suggestion made there, Mr. Wing tried out a similar hive, and he has developed its use to the point of making it a very essential factor in the successful maintenance and manipulation of baby nuclei throughout the season. This stock hive is made up of units or bodies each 18½ inches long, by 8½ inches wide by 6½ inches high, inside. They are open at top and bottom so that they may be tiered up like the ordinary hives of today. Separate top and bottom boards are provided, and the entrance is at one end. The small frames for brood and honey are suspended crosswise of the length of the hive, and supported in the usual way by tin rabbets set into the top sides of the hive body, a one-fourth inch bee space being left above and at the ends of the frames. The top bars, sides and bottoms of the frames are made of the same size wooden strips, viz.: one-fourth inch thick by three-fourths of an inch wide. Each hive unit will hold 17 frames properly spaced. The length of the top bar of the frames is 9⅛ inches, so that they may be used directly in the baby nuclei twin mating boxes described by Pratt in "Simplified Queen Rearing," and supplied for the past several years by dealers in bee supplies. Instead of the separable wood and fiber covers supplied with the older boxes, however, Mr. Wing prefers a box equipped with a light, double wooden cover made to handle all in one piece. The usual enamel cloth, over the twin box, tacked to the top edge of the division board, is used under this wooden cover.

The advantage of the stock hive lies in the ease with which transfers may be made between it and the nucleus boxes and vice versa. Strong colonies are kept in the stock hives and two, three or four of the long bodies are tiered up as needed to accommodate the colony. Quite strong colonies are needed, of course, for drawing out the new combs and filling them with honey, and for supplying a large amount of brood through the season. During a light honey flow, when the little cluster of bees in the baby nucleus cannot gather enough food for its own use, the stock hive will still be storing a surplus, and this surplus may be drawn on at any time to supply the nucleus with stores, frame for frame being exchanged. Thus the feeding of syrup in the nucleus may usually be avoided by this plan, so that time is saved and danger from robbing is reduced to a minimum. If feeding of syrup should become necessary, it is much safer to feed the strong colony in the stock hive, and then give the filled or partly filled combs to the nuclei.

But a further and even greater advantage of the stock hive comes about from the fact that it always contains abundance of brood for easy interchange with the baby nuclei during the queen rearing season. It often happens that a nucleus becomes weak in bees—a frame of hatching brood from the stock hive will quickly recruit it. Furthermore, if a virgin is lost on her mating flight (or in any other way) all brood in the nucleus may become sealed or even emerge before the next virgin, accepted by this particular nucleus, is ready to make her mating flight, and in that case practically all the bees in the little colony may sometimes swarm out with the virgin as she leaves the mating box. This causes confusion and may break up the nucleus. Practically all such trouble may be avoided by supplying any such nucleus that may need it with young brood from the stock hive at the time a virgin or ripe queen cell is given. This young brood will hold the attention of the bees in the little nucleus when the virgin leaves on her mating flight.

It must be noted that the "swarming out" of a baby nucleus with a virgin does not correspond in any way to "swarming out with a laying queen," which is prone to happen in case of baby nuclei during a honey flow, when the newly mated queen quickly fills the little frames with eggs. Swarming out in the latter case can be prevented only by removing the young queen as soon as she begins to lay, or by confining her with a queen excluder for a few days until she may be sold or used otherwise.

The stock hive, therefore, as the name implies, is the stock or storehouse , or mother colony—ready at any time to supply all the wants (outside of virgins or ripe queen cells) of a number of baby nuclei. Such a hive will support 15 to 25 baby nuclei, according to the strength of the colony and the character of the honey flow; and it certainly makes for success in the management of baby nuclei for economic queen production.

A study of the various methods of queen rearing, found in literature on beekeeping, shows that in every case an attempt has been made either to imitate, with more or less success in an economic way, the situations and accompanying conditions that normally lead to natural queen rearing by

the bees, or to take advantage of these as they arise. Three situations of this kind are known. The first of these relates itself to the various conditions which together generate the swarming impulse; the second, to that condition of decline or gradual failure of the reigning queen which leads to supersedure, and the third situation is presented by removal or loss of the queen from any cause, when eggs or young larvæ are present in the colony. The loss of the queen may happen to a colony at any time, of course, in season or out of season, but the attempt to rear a new queen is most apt to be successful when the loss occurs during a honey flow; it is least apt to end successfully under the conditions attending a dearth of nectar and pollen. The first two situations normally come about **only** during a honey flow, queen cells for swarming being usually built during the early part of a major flow. or perhaps at the height of the flow; and supersedure cells, during the latter part of the flow, when the queen may have become exhausted. A "honey flow" and those conditions which always accompany fresh nectar and pollen in the hive, are therefore of the very highest importance for the production of large fertile queens. It is, perhaps, needless to say that these same conditions are likely to insure also the presence of well fed drones in the queen rearing yard. When many queens are to be reared, it is best to make the operations continuous over a long period, and on that account a location is desirable where a long flow of nectar may be expected in connection with a fairly continuous supply of pollen. No shortage of pollen is likely to be experienced, but at times, in some locations, it happens that the bees do not gather enough pollen, even when a surplus of honey is being stored. A scant flow of nectar may be supplemented by feeding, but all pollen must be brought in by the bees, and unless at least a little pollen and nectar are coming in it is very difficult, if not impossible, to rear the best of young queens. The pollen is necessary as a food to keep the rearing of brood of all kinds in progress during the season; the supply of royal jelly will be scant if the amount of pollen available to the nurse bees is too little, even though sufficient nectar may be available. Forty-five to fifty-five per cent of the constituents in royal jelly has been found to be nitrogenous in character. The ultimate source from which the nurse bees must elaborate all this nitrogenous or protein portion of the jelly is pollen. Conditions of this kind pertaining to the food supply have been taken into account in the management of the Wing yards. Sometimes, in order to keep both pollen and nectar coming in over a long period, it has been found necessary to carry on the work in one locality during the first half of the summer and then move the entire queen-rearing outfit to a different location where a "honey flow" was available for the remainder of the summer and fall, and this practice also has been made to yield economic results.

Physiology Department, Stanford University, California.

SOME NUTS FOR THE LEAGUE TO CRACK

By E. G. LeStourgeon

Can the interests of Colorado and California, and the interests of Michigan and Wisconsin (both producers of high grade honeys and both seeking a market) be harmonized?

Are their interests antagonistic?

Should the large producer, already established, boost the game of a competitive beginner or novice?

If certain supply interests are antagonistic, have they sufficient ground of common contact to make co-operation possible?

Is it advisable to have a large voting membership, or a small representative group?

Will it pay dealers in honey to cooperate to the extent of giving their competitors real information as to markets, supply, prices, etc.?

Can the difference in the grades and flavors of honey from diverse districts be harmonized?

Most of us live in the past. Some men live in the present, but a very few have the rare gift of being able to live in the future. That group of men which gathered in Philadelphia so many years ago, lived not under the rule of King George, but lived under the government of the United States, lived through the constructive days of Washington, Madison and Jefferson, through the days of Lincoln and Lee; through periods of prosperity and financial despair; through the World's War, and live even yet. As they planned so long ago, so it has come to pass. We plan, we invest, we vote, as if the world were fixed and dead; as if progress in method of government and business did not exist.

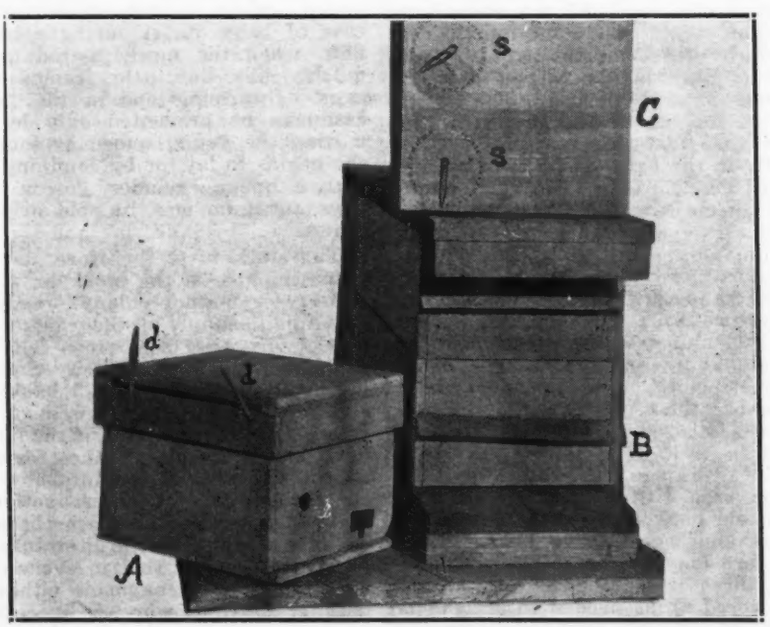
Throughout the history of beekeeping, and especially after that time when men sought to better their conditions by association, a few have been able to see in terms of the future, a few have been able to think in nation-wide terms, but those who were associated with them were men who dealt only with yesterday, believing that tomorrow would be the same as today.

The men who last January met at Kansas City and wrote the aims and objects of the American Honey Producers' League wrote better than they knew. Meeting as they did at the psychological moment of the century, they voiced the future. Their utterances sound more like opiate dreams than prophecy. So did the preamble of the Declaration of Independence to weak-kneed colonists who believed that they could live and reform George III.

The findings of the League have been condemned as visionary and even idiotic by the conformists, and justly criticised by its friends. Not a word or phrase is there in tentative constitution of published objects that has not received the attention of some critics, constructive or destructive.

These articles of organization have been judged by the ethics and business principles of yesterday. Dire predictions, made by many, will surely come if things remain as they are, but just a year has shown that the trend of the whole world is toward co-operative work. True it is that nature, sentiment and belief cannot be forced, as is evidenced in the failure of many attempts to instantly cooperate units unrelated in any common cause.

In order that we may discuss these objections advanced by critics and give the plans of the League, let us take them up in the order in which they are assailed.



A. Twin baby nucleus hive. B. Stock hive. C. Nucleus cover on edge, showing day and month signals at S.

Harmonizing Sectional Interests

Can the interests of Colorado and California, the interests of Michigan and Wisconsin, all producers of high grade honeys and all seeking a market, be harmonized?

Emphatically, these interests cannot be consolidated or harmonized on the present business status. The League is larger than any state or group of states. It can see the consumers' world as a whole. It can see that if all the honey of these states is rushed to some marketing center, price cutting, market stagnation and strife will continue. If the yield of honey is great or the number of beekeepers increase the inevitable result is the lowering of prices. What is the result? The beekeeper is starved out; gives up and quits. If he were the only one affected, it would be a matter easily remedied, but he is not, he is a cog in the transmission gear, a broken cog, and the whole machine is out of order. The manufacturer of bee supplies loses a buyer; the bee paper, a subscriber; the can maker, a sale; the railroad, some freight, and so on through a long line of others dependent on bees for a livelihood.

The League cannot press any magic button and quiet the troubled business sea, but it can by the machinery of the beekeepers' association now extant, so change the marketing situation that complete harmony can be foreseen in complete organization. How is the League to do this? By its organization to hold the honey and force the price? No, that would be a trust, would make the beekeeper a profiteer of the first water. The solution offered by the League is to create a demand for the honey. To create a demand that will absorb all the honey offered, to have this demand throughout the States and then so distribute the offerings of honey that there will be no clash of regional interests in some restricted market.

When the demand is created, the supply will determine the price. It must be remembered, however, that the price of honey will always be governed to a greater or less degree by the price and availability of sugar and syrups. To create this demand, the League must advertise and advertise heavily. It must reach the most remote village of the continent. It must place before the housewife all the virtues of honey. It must do this in a way pleasing, convincing and attractive, yet not lavish. But how can the League advertise? Printers' ink, printers' paper, magazine space and billboards cost money, and lots of it. Men capable of carrying out such a campaign are high-priced men, and are worthy of their hire. The League has no money? Its officers are generous, but are not millionaires. The League is not the officers. The League is not the representative of the State associations. The League is the united force and power of every member of every interest or body included in the League. The officers, in handling demands for money, act just as they do in the distribution of honey. Now, there are ten of the most important co-operative honey-marketing associations and several private firms ready to stand behind this movement. Each has its own way to raise funds. Each is ready to raise its fair share. Just as soon as these large associations make the start, the smaller ones will be glad to join. Should all these not be able to finance the movement, an organization campaign will be of greatest value. Let each association decide how to raise its quota, whether by voluntary subscription, assessment per member, per colony, or otherwise.

That extensive advertising will create a wide demand has been proven so many times that it needs no discussion. With this demand comes the greatest problem of the League; one that will require the greatest changes in our present system. To create a demand and not be able to fill it is a triple loss, the loss of the initial sale, the loss of a permanent buyer and, greatest of all, the loss of the buyer's confidence in the firm advertising.

Better Distribution

Distribution is our greatest problem. Solve that and the clash of States and of regions is solved. But to solve it, vast and radical changes must occur. Our present system of supply and demand reports must be converted. Instead of wholesalers and commission firms reports, which no one pretends to believe, we must have the managers of the separate associations get a report on honey produced and sold by each member of his association. As such reports are all in the family, as it were, a very true estimate of the supply can be compiled. To get the demand, a new system will have to be devised. The reports will have to come from the stores selling directly to the consumer. This can be done, but remains the big job of the League Secretary. With these two systems perfected, a traffic system can be effected that will give adequate and accessible nation-wide supply.

The League has two sets of problems to solve—internal and external. We have, in a way, touched the high points of our internal troubles.

Outside we have two that demand immediate attention. The first is so close that while it is small, it is an aggravation. Can we give the competitive beginner or novice the benefit of our experience and of our grading and sales system? Our business depends not only on what the buyers think about League packed honey, but about all honey. Let one such novice put a lot of poorly packed, inferior honey on the market, and not only the novice, but we, will be the losers. We can, and must, adopt or regulate these beginners.

Of the minor problems little need be said. They disappear with the solution of the big ones. The question of grading and standardizing honey is one that troubles many. Can the many flavors and colors be marketed on a standard pack system? They can, just as many grades and sizes of peaches or apricots are sold. So can the honey from localities which have large supplies of a certain flavor. This honey should be packed and sold as a named standard. But where there is little supply, even a very choice variety, with the exception of the local market, all honey marketed should be blended and sold as such. It is highly probable that all honeys, including our choicest flavors, should be blended, and often the blend is better than the pure flavor, the New York Globe to the contrary notwithstanding.

The big outside problem is with whom shall we join to get the best service and aid. There are many men of many lines of endeavor who depend as much on the bee for a living as we. The manufacturer of bee appliances and honey containers, of tanks, of bottles and numerous other articles; editors and publishers of bee and farm papers, printers and lithographers, transportation and storage companies, and in a less manner many other lines of business have interests in common with the owner of bees. With these industries allied with us, we can do much more business, and do it in a far more satisfactory manner, than if we are at outs with them.

We most certainly should welcome into the League any interest that has common cause with us.

Our ruling or governing body is a problem in itself. Because of the nature of the work it must perform, it seems advisable to restrict this body to its lowest limits, as we know from sad experience that numbers in legislative halls spell delay and perversion of measures. Where large numbers vote, a man with a glib tongue and an axe to grind often kills or demoralizes the wish of the majority. Let us pick, as the members of the League Council, the shrewdest business men in the bee world and let us keep the representation small. Let each association send one man; a man in whom they trust, in whom they have faith, to represent them, and under the guidance of such a body of chosen men the League cannot help being a success.

SUPER CLEANING

By J. F. Dunn

You ask for a description of the Deadman super cleaner and my modification of the same. The ones we have been using for a number of years, except that they are of lighter construction, are substantially the same as those used by Mr. G. A. Deadman, the inventor of this (to us, at least), indispensable arrangement for having extracting combs cleaned bone dry by one colony of bees. One platform will take care of all the combs from an apiary of 50 colonies. The frame under the platform is of 1x4 inch lumber, laid flatwise. The floor is of three-eighths inch stuff and must be either tongued and grooved or have very tight fitting joints. The strips dividing the platform into six sections are three-eighths of an inch thick, and wide enough to admit of the covers being placed on the supers

without touching one another. We make them 6 inches wide. The outer border strips against which the others butt are 2 inches in width. The reader will notice that on the dividing three-eighths by 6 inch strips there are shown white marks, which indicate the position of the ⅜x3½ inch entrances from the colony hive to the supers containing the combs to be cleaned.

Here is where we have varied the construction, and like it much better than the super cleaner as originally made. By the individual entrance from the colony to each row of supers, separately, the bees are obliged to carry the honey from the supers straight into their hive, and will place it all in the super above the colony. Where the spaces under the rows of supers are left entirely open and free access given, the bees will, under certain conditions, place a portion of the robbed-out honey in the combs of a neighboring super instead of placing it in the super above the colony, where we want it. This is the more apt to happen if the super above the bees is more than two-thirds filled. In choosing a colony to do the cleaning, we select one that is not strong enough in field bees to bring honey from the fields, and yet has lots of young bees and plenty of hatching brood. If kept well supplied with supers to be cleaned, few bees will go to the fields, as they have plenty of better stuff to salvage right at home. About all the bees that do go to the fields will gather pollen, and the queen will be pretty busy laying eggs. We like to have this hive supplied with a young queen. The entrance to the colony, which may be seen in the center front of the photo, should not be more than ⅜x3½ inches. We place the combs on the platforms just at evening; everything is quiet by morning, and we have never had a "cleaner-up" colony robbed; they are always among our best colonies in the spring, and we have never had one used for this purpose die in winter.

One thing has always puzzled us. We have several times had European foulbrood develop in the apiary, and although super combs were given to these bees, the disease has never appeared in any of the "clean-ups," as we call them. We certainly would not risk it if we had American foulbrood.

The photo shows 25 supers on the platform. We frequently place more than twice as many at one time.

The colony (center front) shows a comb-honey super above the brood-chamber. When we use a comb-honey super over the brood-chamber we have no queen excluder under it, but when the honey taken from the (shallow) extracting frames is to be stored in extracting combs we put a queen excluder under the super. Care must be taken when sections are over the brood-chamber that the queen is not crowded by a congested brood-chamber.

We have farmer beekeepers about us who raise some comb honey but seldom have the "dishes right side up to catch it." We furnish them supers filled with sections and foundation; the supers have the weight marked on them. Just before the close of the clover flow, which is our extracting time, we run the light truck out to gather them up and pay them the price agreed upon net weight of honey. We get a fair percentage of sections filled plump to the corners, and a good many unfinished ones.

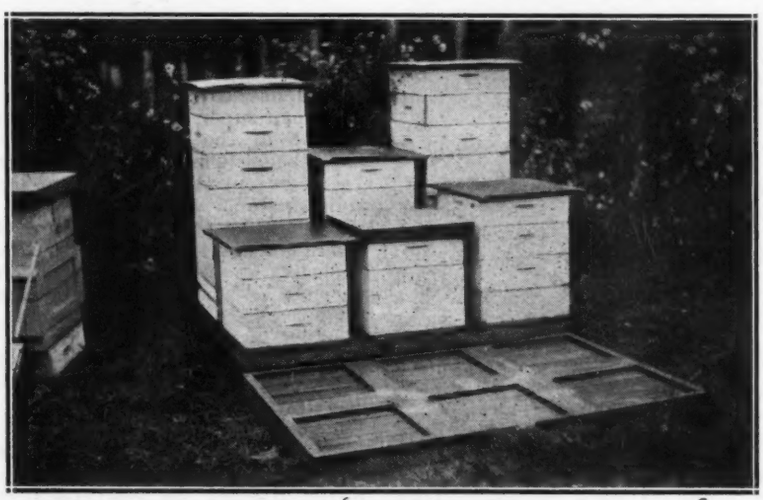
Here is where our super cleaner "scores big." The unfinished sections are carefully graded and placed in the supers to be filled from the wet combs, and the bees certainly make a good job of it, for we have very few unsaleable sections at the close of the season. We frequently have three or more supers over the colony at once, and as the honey stored in them is thoroughly ripened they are ready to be capped about as soon as they are filled.

We find it a good plan, with the best filled or nearest perfect sections, to take them away from the colony as soon as they are filled and ready to cap, and give them to a strong colony that is storing and capping honey, placing a fresh super on the "cleaner" about the same time.

If the super is placed on a colony that is not storing honey they would be very apt to rob it out and carry it below.

It will be noticed that the hive doing the cleaning has the regular hive cover over the super. We use the same on each tier. The ones shown are the galvanized covers, without the rim. We were short of finished covers at the time.

Ontario.



The Deadman super cleaner. A colony of bees is placed in the middle of front row. Supers of wet combs are piled over the other positions with entrances opening into the hive to permit the bees to clean them readily without exposing them to robbers.

FIFTY-FIVE NORTH

By F. Dundas Todd

The northern limit of beekeeping in Europe, with the exception of Scotland and the Scandinavian peninsula, is the parallel of 55 degrees. British Columbia's most northerly important valley with railway transportation lies pretty well, along this parallel once bearing about 20 seconds north of it. As I have told my readers before, I have long felt interested in this region for its beekeeping possibilities, but never could find time to investigate. At the opening of the past season I decided to have a look at it, especially as there were not less than half a dozen beekeepers scattered at intervals whose experience would be worth hearing. One was a beginner at Telkwa, who received a hive at the beginning of June, 1919, and reported he had taken from it 186 pounds of extracted honey in August, and had left plenty of stores for winter, plenty being about 80 pounds of honey. And he enthused greatly over the superb flavor

At the end of May I shipped two nuclei to a town called Terrace, which is located where the eastern and western climates meet. It has much less rainfall than the western slope of the Cascades, yet produces the enormous cedars and fir trees of that region, but has a shorter and less severe winter than that farther east. I planned to go straight to Telkwa, thence to Terrace and back to Victoria.

I boarded the big, fine steamboat of the Grand Trunk Pacific Co. at Vancouver on the night of the 9th of August on my way to Prince Rupert. When morning broke I found we were rapidly moving over a perfectly calm sea between Vancouver Island and the mainland. I will not attempt to describe the voyage north. It is a most delightful experience, among hundreds of small islands, each covered to the very top with evergreen firs and cedars, while the background is a range of snow-covered mountains. Wednesday noon saw me on the train for Telkwa, which I hoped to reach at midnight, but the fates interposed a small imitation of the nether regions in the way. At Hazelton the railway skirts a magnificent canyon for quite a distance, and at one point crosses a small arm by a bridge. Shortly before we reached Hazelton two cars

laden with sulphur, on a west bound freight train, jumped the tracks, flopped over the side of the bridge and found a resting place at the bottom of the canyon 150 feet below. This was bad enough, but the sulphur caught fire, and then there was a powerful odor for many miles round. We had to wait about ten hours until the fire burned out. At dawn we could see white smoke lazily hanging in the air for many miles, just the tips of the trees in the lower valley showing above the haze. No human beings lived there, as far as known, and I feel certain no living thing could survive that night.

A late breakfast at Telkwa, then about 11 o'clock I was in a motor car for a 12 mile run to the nearest beekeeper. The town stands at the junction of the Bulkley and Telkwa Rivers, in the midst of wonderful scenery. The valley, I fancy, is about 30 miles wide, dropping down by slow degrees from snow-clad mountains 9,000 feet high. My route lay along the banks of the Telkwa. Sweeping out of the town the car in a couple of minutes landed me among the fireweed, and for 30 seconds I gazed at it puzzled; there was something about it very different from the fireweed I knew in the Frazer Valley. The bloom was all right, but sticking out conspicuously were thousands and thousnads of white crosses that had never attracted my eye before. The car was stopped and I grabbed a head. The cross was merely the anthers, big, fat, white, healthy, not like the ones I knew, which were short, lean, grey. What did this mean? Next, to tear the bloom to pieces to see if it contained nectar, an old trick of mine. No need, just look at that blob, a big drop of nectar caught at the bottom of the stamens and pistils; it must in itself be a load for a bee. More blossoms were examined, thousands of them, every one with a cargo of nectar for a honeybee—and not one in sight. Miles and miles, and again miles of fireweed, tons and tons of nectar available for the use of man, but only one hive to gather it, and it 50 miles from its nearest neighbor. So for 12 miles I sat, observed, and wondered if that region, that day, were but specimens of other regions and other days in the Grand Trunk country of British Columbia. Again and again I got out and examined the plants and the surroundings. Wild strawberries low down, wild raspberries higher up, the fireweed above all, a solid mass in length, width and depth of nectar-bearing flowers, with no ferns to choke their growth. The half had not been told me by my son, who knows the region well.

At my journey's end I find the beekeeper and his hive, both towering pretty high in the air. "How's the crop-" "Well, I have taken off a hundred pounds; want to taste it?" I did, and did again. Fine, very fine; could not be otherwise with so much wild raspberry around.

"Now, go to the hive and say how much more I may take off." Three stories of 10 frames each of solid honey, then one with 3 frames of brood and 7 frames solid honey, a total of 37 frames of honey. My judgment was, take two superfulls, leave the rest to the bees.

He was selling his crop to neighobrs at 40c a pound, the customer providing the container. Eighty dollars for one hive. I asked him, "Do you realize that 12 colonies will give you a living?" "Sure, but the beggars will not swarm; what am I going to do about it? I ordered a queen weeks ago, but she has not come yet." Two seasons, no swarm; why? April and May are unsettled months, then comes the heat and the nectar, and the bees are busy.

I explored the country round as far as a car would go, and saw hundreds of square miles of raspberry and fireweed. Then people said: "this is nothing, you ought to see so-and-so, the real stuff is there." But good gracious, if last year and this year are fair samples of the Bulkley Valley, every acre of fireweed is worth $50 to $100 a year and will pay far better as it lies right now than it will ever do under cultivation.

Then to Terrace, where terraces marking old beds of the Skeena River, rise one behind another. It brags about its fine strawberries, best in the world. So I asked the cook on the train where he bought his supplies. leading deftly up to my objective, which was strawberries. These he bought in Terrace. Why-Well, he thought I had never eaten a really fine strawberry if I had not eaten one grown in Terrace.

I did not get around much from the town itself, so saw only a few square miles of the country, and did not enthuse much over its honey possibilities. But one nucleus I shipped up at the end of May, consisting of 6 shallow frames of brood, had drawn out 16 ordinary and 16 shallow frames, and filled them all with fine honey. I gave the owner over 60 pounds, and insisted that he leave 75 in the hive. His wife was eager to know what she could sell it for, but the twinkle in the eyes of half a dozen young folks told me she would not sell a pound.

A similar nucleus had been managed by two different people, just as they happened to come around, with the result the queen got killed, and one swarm had issued. Both were in fine shape, but the honey on hand was just a little more than sufficient for winter stores. So probably I was mistaken in my snap judgment of Terrace.

I left the valley with the feeling I had seen a region that some day will be the heaviest honey producer of this continent, a district where a man could put down all the hives he could personally manage in one spot and get a big crop from them all. I also think it will be a land of simple beekeeping, one where swarming will be the exception rather than the rule. The thaw comes about the beginning of April, but the season does not warm up until towards May, then by the time the warm weather has developed in June, nectar is being freely secreted.

The only meteorological records available are those of 1919, and these give a minimum temperature of 9 degrees below zero and a maximum of 85 degrees above. The average mean temperatures are, January, 27; February, 23; March, 25; April, 40; May, 47; June, 53 and July 57 degrees. The rainfall is about 40 inches, well distributed throughout the year—about 2 inches each in June and July, which accounts, probably, for the fireweed's profuse secretion. Snowfall is about 5 feet.

East of Terrace the timber consists mainly of jack pine, alder and poplar. There are very few trees with a bole of a foot in diameter, so there is little likelihood of wild bees in the timber.

SAVE THE COMBS

By L. H. Cobb

I have seen hives filled with built-out combs left to the tender mercies of the moths when the bees had died in winter, and most of them were destroyed before any use could be made of them. Now in these combs the beekeeper has a definite value, of which regular beekeepers are well aware, but which the amateurs and the farm beekeepers have not considered. Building comb is a costly process, and I have known times wher a colony would give no surplus at all if forced to build comb, when with ready built comb there would be a slow but gradual gain. On a very slow flow, built-out combs in full frames will get the honey if there is any to be had.

One young beekeeper, who had gathered together fifteen or sixteen colonies during two years, lost all but six of them one bad winter. He took the empty hives and stacked them alongside the barn, and while I did not investigate them, I know that during that summer those combs were ruined. Bees going into winter provide a supply of pollen for the young in the spring, and this pollen attracts the larvæ of the beemoth. With no bees to keep them out, and no attention from the owner, they will tunnel every comb until it is ruined. Even with bees in the hives they are hard to keep under control—except with pure Italians—and they work so fast that it takes early and sure work to prevent trouble.

When it is discovered that the bees are gone, it is a good idea to pile the hive-bodies one on top of another with the frames in them and with a tight board bottom. Place an empty super on top of the pile, and on the frames of the upper hive set a saucer with an ounce of bisulphide of carbon in it, being very careful to have no fire about. The gas will settle down through the frames and kill anything in the larva line, and then you can set the hives so no moths can enter and keep them away from moths pretty securely, but it is best

to give another fumigation now and then until you want to use the frames.

If you can put the old hive over a strong colony the bees will clean it up, removing the pollen and any honey that it may contain, as well as the dead bees. After the hives have been cleaned up well they can be piled and fumigated. I have kept hives with frames free from pollen for months without fumigating and had no trouble with them. (Better not risk that too long.—Editor.)

Kansas.

CANDIED, GRANULATED OR CRYSTALLIZED HONEY

By E. M. Cole

If it is correct to use the term "crystallized honey" I suggest that we use it in talking and writing about honey instead of candied or granulated honey. I think it would make a better impression on the mind of the customers—an idea of something desirable instead of something to be avoided.

It seems to me we ought to avoid using any expressions on our labels that tend to create a doubt in the mind of a customer, such as, "Some people imagine granulated honey is impure," or "Pure honey will granulate in cool weather, but is in no way injurious."

Better to simply urge the use of "crystallized" honey.

Some plan ought to be worked out by our State Associations whereby a producer who cannot supply all his local trade might procure honey from some nearby beekeeper who has an over supply. This would tend to higher prices on the general market and ought to be reflected by better prices for local sales.

I could have sold last year twice the amount of honey I produced, and handled it all in 60-pound cans, but the two lots I bought for my customers were unsatisfactory, and entirely on account of uncleanliness. When straining honey through cheesecloth, its weight forces a good many particles of beeswax through the cloth, and when the honey is drawn at once into 60-pound cans there is soon floating on top of the honey a pretty heavy layer of beeswax refuse; a sample from the top of one of these cans is anything but inviting to the customer.

I hope our State Associations adopt some label to be used by its members which will carry an assurance of the quality and cleanliness of all honey sold under that label.

Iowa.

HONEY DISTRIBUTION

By A. G. Woodman

With stronger beekeepers' associations in the different States it is to be hoped that they will soon get into a position to engage in the packing and distributing of some of the crop of their respective States, at least do enough business in this line to establish prices. This would have a tendency to line up the beekeepers who are selling honey in their different localities. For instance, a beekeeper about 30 miles from here a few days ago inquired about our present prices. He stated he did not know much about market conditions, but tried to keep in line with our prices. There are any number of beekeepers who would, to a large extent, follow such leadership in case there was reliable guidance for their consideration.

The above, as a local or State proposition, can be worked out in a national way. The cost of distribution should be figured on large city costs. Some small communities would figure out considerably less; this would be up to the individual.

To give you some idea of the costs of distribution, we mention a local concern here, located across the street from us. This is the Grand Rapids Dairy Company, a corporation of farmers organized for the purpose of distributing their product direct from producer to consumer. This was supposed to be a short cut and to benefit both the farmer and the consumer. At the present time they are paying their members 20 cents per gallon for milk. The retail price is 13 cents per quart, or 7 cents per pint, making the retail price 52 and 54 cents per gallon. One would naturally think that this would be a money-making proposition for the stockholders, the farmers, who produce this milk and sell it to their own organization. However, it has never as yet paid a cent in dividends. Recently one of the stockholders offered his $500 worth of stock for $200. From this the beekeepers and others ought to be able to get some idea of the cost of distribution. These people have a fine building and the best improved machinery for the work. Before this organization was formed there was one large concern engaged in the milk business and a good many individual farmers who were peddling their own product. In organizing this Grand Rapids Dairy Company, all of these milk peddlers were taken into the organization, or forced out of business on account of the producers or farmers who had joined the organization, refusing to sell their milk to them. In this way practically all competition was eliminated, leaving only two large concerns, the farmers' organization, the Grand Rapids Dairy Company, and the Sanitary Milk Company, a private concern.

Based on the cost of distribution of milk as shown above, the retail price of honey in 5 and 10-pound tins should not be less than 100 per cent above carload prices, plus the cost of packages. In other words, 12½ cent honey should not retail for less than 25 cents per pound, plus the cost of the packages, or in the neighborhood of 30 cents per pound. We have had some men out selling honey in a house to house canvass the past winter. It has cost us about 7 or 8 cents per pound for the selling. The cost of delivery would run from 2½ to 5 cents per pound, depending upon number of orders, location to one another, etc. In figuring on the smaller glass packages, the percentages will have to be more than on the larger. The retailer ordinarily wants a larger percentage of profit on a 10 to 25-cent sale than on one of a dollar or more.

The beekeeper, in order to put the honey business on a substantial basis, should so conduct his business as to protect those who wish to engage in the sale of his product. All large businesses that are successful are based on organization and systematic methods of distribution, with ample rewards for all who are engaged in the work. The more people the beekeeper can interest in the sale of his product, the more competition there will be, and competition in buying means a strong market and higher prices. In order to interest people in the sale of honey, these salesmen must have a legitimate working profit, so as to keep them in this line of work. The only way that the beekeeper can do this is to protect the honey salesman by not selling retail quantities at wholesale prices.

Production should be considered as one end of the business.; distribution another end. Each should be so conducted as to result in a profitable business by itself. If the beekeeper engages in the distribution of his crop, he should figure what it is worth at wholesale as his cost price. On this he should figure a profit that will pay him for his time and some besides to keep the distribution end of the business healthy.

In discussion at a convention, I once heard a nationally known beekeeper call another beekeeper a honey peddler, not a honey producer. This beekeeper, producing a comparatively small amount of honey, was giving his methods of disposing of his crop. He really was devoting more time to the selling end than he was the producing end. He was not securing enough margin above the wholesale price to make it a healthy business proposition. There are some who are better fitted for the sale of honey than for the production, and in such cases it would be to their advantage to quit production and devote their entire time to distribution.

For a good many years we were quite extensively engaged in the production of fruit. Along with other large quantities of all kinds of fruit we produced on an average of one to five thousand bushels of peaches for 20 years. At that time we had a local organization known as the Grand Rapids Fruit Growers' Association. We did not attempt to sell our fruit at retail ourselves, but sold wholesale by the load only. The only thing that we did was to advertise the crop in an effort to get buyers into our Grand Rapids market from many different States and parts of the country. The more buyers we could get in here, the more competition there was, and the stronger the market. I have seen the market go up gradually 10 to 25 cents per bushel each morning, until finally prices reached such a height that the market would break. I have seen the price break in a single morning as much as 50 to 75 cents per bushel. From this you will see that there was even danger in getting too

much competition and too strong a market, prices so high that the buyers could not make any profit, which worked to our advantage. At this time, in a single morning the Grand Rapids market had as high as 65,000 bushels of peaches on it, all of which would be disposed of and out of the farmer's hand by 9 a. m. At this time there were numerous efforts on the part of the city people to establish retail markets, but without much success. The larger growers preferred to devote their entire time to production and leave the distribution of the crop to established trade channels, the wholesale or carlot buyers, grocers and hucksters.

There is advantage to the beekeepers in interesting as many people in the sale of honey as possible, and a necessity for protecting their interests and making it profitable for them.

Michigan.

HIVE RECORDS

By L. A. Schott

In the spring of the year I tack on each hive, on inner cover, a card, and every time I look at a swarm and note its condition, I date the card and mark the percentage in the space. I use the 100 per cent for a good strong colony, there being ten frames, it is easy to calculate the percentage. I also note the queen, age, etc. I use the following method in regard to queens: x queen is an extra nice one, but do not know about her offspring; (x queen x) marked thus shows the queen is extra good and her offspring is extra good. But when I mark one thus, o queen, it shows she is poor; oo, she is very poor, and should be replaced at once. Also, if I mark one x or xx in front of the word "queen" and follow with an o or oo, it shows she is nice, or queen, but has mated with a bad drone.

When a queen dies or is replaced with another, I run a line through her record and start a new one below, there being four spaces, which I find to be a plenty. When a colony swarms out I make a record on the hive that it is hived in and start a new record with the virgin. Whenever I take any honey I always mark about the amount taken. Whenever a super has as many as 20 or 24 complete sections, I put underneath a new one with a bee-escape board between the two. In that way they are never crowded and seem more contented. The honey is taken off the next day and the unfinished sections are left in the super and filled in with empty ones. I then give the super to the next hive that needs one. In that way I do not have travel-stained sections, and, besides, the partly filled sections act as a bait for the next swarm.

I also have a record on my stool of all hives that have any honey in supers. I use the following method: Whenever I peep into a super and see one half full I put a circle half way around its number on my stool record, and when I look again, in a few days, and it is three-fourths done I increase my circle until it is as full as I want it. So when I look on my stool and see a hive that has only a small dot under the number I know I do not have to bother it for a few days. My stool record is re-copied every 10 or 12 days, as the case may be.

I also note the ripe cells in a colony. If it should be queenless, number 44 has 7 ripe cells, by the dots around the number. So I can tell at a glance where I can get a cell if I need one.

Whenever a colony gets back to normal it is erased from the virgin list, or queenless list, as the case may be. I have now tried this out for several years and find it works fine; but one must use hives with inner covers or it will not do, for the weather would soon destroy it.

Missouri.

(We give the above letter because Mr. Schott appears very methodical. We can give one suggestion additional: We used to keep a similar record, when we worked with a less number of apiaries than now. In order to avoid lifting the hive cover to get to the record, we used to fasten it on the back of the hive with a tin holder, made as per engraving. If it is rightly placed there is no danger of its being damaged by rains. But one might use the precaution of covering it with a sheet of tarred paper.—Editor.)

BEES OF AFRICA, ALGERIA AND MOROCCO

By Ph. J. Baldensperger

As I wrote you, after leaving Spain, I went over to Algeria and looked for bees. Since about 10 years my attention was called to two kinds of bees existing in North Africa. In vain did I try to get hold of some of the yellow bees. Mr. Bernard, who gave you a description of them in the American Bee Journal for October, 1917, page 341, was the only person who has had possession of any of them, and his description is too short to give an idea. He had promised to let me have some queens, but he failed in his raising scheme, at Algiers. Another gentleman who had also promised me some could not keep his promise. So I resolved to go and hunt for those bees myself.

North Africa, from the Gulf of Gabes, east of Tunis, to the Atlantic Ocean, consists of Tunisia, Algeria and Morocco. Three mountain chains cut these three countries diagonally, from northeast, between Tunis and Sfax, to southwest between Agadir and the mouth of the river Draa, on the Moroccan coast of the Atlantic.

The different chains are: the Small Atlas, starting from near the Mediterranean; the Great Atlas, from Algeria towards Agadir, with peaks over 10,000 feet high and covered with snow, running down to 3,300 feet, south of the provinces of Algiers, Oran and Constantine; then the Anti-Atlas, south of Sus and Agadir. The description of these mountain chains is necessary in order to show why the black bee of the "Tell' (hills) in the north, has never come in contact with the yellow bee of the south regions near the Sahara. Fully 125 miles of arid steppes and high mountains lie between the black and yellow bee regions. Only halfa, diss and drinn (all coarse grasses) grow there. These 3 graminaceæ are fit only for fodder for the camels which the nomadic Arabs keep in great herds on these steppes. Not a single flower could I detect in the long trip on the high plateaux. Of course not a bee will venture across these cold plains in spring, as they are all over a thousand meters above sea level. Besides, what would they look for in these lands, fit only for camels? These animals are not as large as those of Palestine and of Syria.

I studied the black bee or "Tellian," which I think is a proper name, because she is found all along the hilly region, north of the Atlas, wherever bees can live, and I found

Metal holder for records, once used in the Dadant apiaries.

her wide and far spread, from Tunis to North Morocco. This bee has been called the Punic, the Kabyle, the Algerian bee, but is the same insect all along the "Tell" or hilly region. So I propose to call her the "Tellian" in opposition to the "Saharian," found only south of the Atlas.

The natives of North Africa are not all of the same race. There are the Arabs, who came from Arabia, and although they imposed their Moslem religion and, to a great extent, a corrupt Arabic language, the Kabyles and Berbers have conserved their own tongue, and their customs, though they all speak Arabic. The Arabs introduced Arabic manners and beekeeping customs all along the north of the Atlas, as they brought the hives with them in their migrations between the eighth and twelfth centuries of our era. They invariably adopted the horizontal hive, known as "Jibha." Some use a sort of fennel-stalk hive, forming a long square, not over 8 inches wide, but over 3 feet long. Others use a cork-bark hive. Being nomads, they always laid their hives down near their camps, ready to take them up and load them on their camels in their march towards the west, from Arabia to the Atlantic Ocean.

For fear of having their bees stolen, they usually laid them near a "marabout," the tomb of a Mohammedan saint, of which many are found in the vicinity of the Sahara. There the bees were in greater security. Centuries have passed away, but still the hives are laid down upon the ground near such sanctuaries, ready for an emergency. I saw groups of such hives in North Morocco and North Algeria, and it would be difficult to recognize that they are hives if the bees did not show by their buzzing and humming that they are as vigilant guardians as their lords, ready to pounce upon the enemy with rapidity.

In 24 hours' time, a train landed me safely near Figuig. I lost no time and at once went to the Moroccan villages. I saw the beautiful bee in Figuig first. She closely resembles the Cyprian, including the golden crescent on the base of the thorax. It was a cloudy day and a single bee started from a hole in the wall; for that day it was not possible to have more than a look at the coveted beauties. I tried my best, compliments, flowery sentences, but to no avail. Two hives were plastered into the wall and nobody could have detected that there were bees behind that wall. The flying hole alone, slightly propolized, showed that bees were passing there.

I wandered over the oasis, in search of flowers, but found only some tiny turnip flowers, the stems of which were hardly a foot high. I saw three bees, in all, trying to suck out the scarce nectar. I wonder how in the world bees have contrived to pull through for many centuries, south of the Atlas. The swarming season, El Hadj Oud Moussa told me, would come in about a month, in the middle of April. If I came back then he might possibly sell me a swarm—if his bees swarm. It was then the middle of March and the ground was white with frost every morning, while at noon the thermometer would mark about 70 degrees. These bees therefore, stand cold winters, hot summers and scant pasturage. There had just been a year without rain. Of course each owner had seen his apiary reduced by half, and of course "it was the moths." Certainly the moths destroy the combs, but the bees died first of privations. So the poor moth gets the blame, though only responsible for damage to the combs.

In the five villages of Figuig I do not believe there are more than 20 colonies in all, if there are as many. I went to the French officer in command and asked him whether he could not help me to get a swarm. He was very accommodating and gave order to a Moroccan soldier to accompany me in a hunt for bees. We enquired of every beekeeper, without success. I went to the farthest station; all in vain. Having traveled from one oasis to another; I found that bees were scarce all along, in the palm tree groves. In the Black Mountains, some 5 or 10 miles away, the inhabitants signalled to me some stray hives of bees lodged in the rocks. I wonder how bees have escaped at all, taking refuge in the rocks and gathering enough to last them through the year.

In the different oases, the tribes have fought each other; and from time to time, the mighty chiefs of Morocco, Tlemcen or Tunis, pounced upon the miserable Sahara villages, destroyed everything or replaced the population with their own. Under such circumstances, how could hives of bees resist? The houses of the Berbers are made of sun-dried bricks, which resist as long as the weather is dry, but heavy rains, which come seldom, are disastrous. The poor inhabitants have been changing masters and religion for 2,000 years.

How did the yellow bees come there? There are many Jews in the region, who came to the country after the destruction of the Temple of Jerusalem. In those days the Jews were good at agriculture, and it is very likely that they introduced the yellow bee into the Sahara, bringing her from the Greek colony of Cyrene, near Tripoli. We know by old manuscripts found in the oases of Oued and Guerara, that the Jews influenced the original tribes (then pagans) to embrace Judaism, and that they taught them Greek Culture and industry. The north of Africa was held by the Phenicians, later known as Carthagenians (now Tunis) and the part farther south by Greeks and Jews. As the travel was always carried from east to west, it is most likely that the Cyprian bee was carried westward to the Saharian part of west Africa. Be it as it may, the two bees resemble each other, in color at least. As I found a few days later, these are much more gentle than the Cyprian, and possess a well-developed smelling organ. I will tell of this farther along.

(To be Continued)

Arkakeba school apiary near Algiers.

SOME EARLY BEEKEEPING HISTORY

Incidents in Massachusetts Colony Prior to 1654

By George W. Adams

IT would be difficult to find a locality in New England less adapted to beekeeping than Essex County, in Massachusetts; for, although we have here many productive farms and beautiful estates, yet the severe winds in winter and other climatic conditions, as well as the fact that along the sea coast the salt meadows and red oak forest land give no pasturage, and very curiously the white clover which yields so richly in Vermont is not nectariferous, or very slightly so, make a serious handicap.

In spite of all of these disadvantages, bees have been kept, and would seem to have been fairly plenty by 1660, for under this date I find in

our Essex Registry the inventory of an estate in what is now Danvers, where a "stand of bees" was appraised at 5 pounds, which, taking into consideration the purchasing power of money, is not far from present prices.

Some one has said that "new truths" are usually the "old errors" and, when I read how municipal ownership will solve all economic troubles, it recalls the early experiment of the town of Newbury in municipal bee-keeping.

The writer has spent a good deal of time in tracing this, perhaps the first attempt in the colony at municipal or public control of a utility.

Fortunately for the historian, however unfortunate for the "expert" who was put in charge of the enterprise, he became our first pauper, and the controversy over his support put the apiarian experiment on record, in town, county and province.

The town received its first settlers in 1535, and five years later the "seven men," or, as we should say now, the select men, established a town apiary, which was also undoubtedly intended as an educational "experiment station," on the farm of one Davis, who is described as a "renter," which would certainly imply that it was plantation or "common" land; the old records saying about this time "Quacacunquen is allowed to be a plantation and the name thereof to be Newberry." There were at that time 91 free-holders.

This town bee-yard was put in charge of a man named Eels, who was brought from what is now the town of Hingham "with," say the colonial records, "ye expectation of his doing service that ye town was not acquainted with." It would be interesting to know where the bees were obtained, and one or two "clews" are now being followed with that purpose in view. A little story is told of a local Indian, who curiously observed the bees at work. He had seen the horse and ox—animals previously unknown to him and his people—and marveled that they should toil at the command of the settler. The honeybee was also a stranger, and the situation seemed to have become serious. "Huh! white man work, make horse work, make ox work, now make fly work; this Injun go away.!"

The winter following the establishment of Newbury's apiary was perhaps the most severe this locality has ever experienced, there being in all probability no possible flight from early in November until March. It will be remembered that Boston Harbor was closed by ice from November 18 to February 21. It is probable that the second year saw the bees in very poor condition. Eels was an old man and evidently discouraged. In a year or two he seems to be "living with" John Davis, rather than conducting a business, and, homesick, perhaps, he "swarmed out" and got as far as Ipswich, on his way to his old home, where he was hived in the jail by an alert constable, and the controversy began as to what town should support him.

A petition was sent to the "Great and General Court," and after due consideration the Colonial Legislature sent down the following order:

"May ye 14, 1645. It is conceived John Eels should be placed in some convenient place where he may be implied in his trade of beehive making, etc., and ye town of Newbury to make up what he wanteth of defraying ye charge of his livelyhood."

One might infer from the term "livelyhood" that the clerk himself had some personal experience in beekeeping; at any rate the spelling is singularly appropriate.

At the time of which I write there must have been a very considerable interest in bees and beekeeping, for, during the same year that Newbury was maintaining a municipal yard, the question of the ownership of an escaped swarm was adjudicated by the full bench of the Superior Court, "Mr. John Endicott, Deputy Governor, presiding, with Mr. Symon Bradstreet, Mr. Emanuel Downing, Esq., Mr. William Hawthorne and Mr. Edward Holliocks on the bench."

The defendant was brought in on a warrant or "presentment," which charged "having sinned against ye county not only in taking away ye good of his neighbor, but by Lying and insineuating to deceive." The Court came in at Salem, on the 25th of the eleventh month, which would be, according to our present calendar, January 13, 1641, and the case was tried before a jury.

The details of the trial are quite fully given, but as the testimony was taken in long hand, the peculiar long hand of a man who wrote in the characters of the 16th century, and as the tongue of the witness frequently outran the quill of the clerk, I found it by no means easy to read. It is, of course, devoid of punctuation, and the paper crumbling with age.

John Kirtland, living in what is now Lynn, evidently had a small apiary and to him came his good neighbor, Jno. Deacon, who testified: "I heard a noyes of bees, and thought they were my neighbor Kirkland's bees and so told him: If you will come I will show you where they are, and so did show him ye place, but ye bees were gone, next morning; said he could not find them, and I pittied him, for ye bees were not found there."

The summer passed and in November the defendant came to Kirkland and presented a claim for damage to his corn, the previous season, offering to settle for a certain tree in Goodman Kirkland's woodland. This delayed claim for unproved damage does not seem to have aroused suspicion, and the tree was freely given. The new owner, however, made the mistake of employing a man to cut it who was evidently of a practical mind, for he testifies: "I put myself to all ye conceits I could know what he would do with that tree; at last I laid my head to ye tree and there a humming and I said there is bees."

"Goodman Deacon also testifieth there is bees in it."

Kirtland testifies: "I gave him ye tree but not ye bees."

The jury found as follows: "We find for plaintiff his bees and if living and well in spring only to pay ye charges of court; if all dead to pay 30 shillings." Court charges were 15 shillings, and two days later an execution was entered in that amount, but the Court, with a leaning to mercy, ordered that, considering "it was ye first time, and ye estate not great, the punishment shall bee only a fine of 20 shillings."

Thus, 280 years ago, the Massachusetts Court established a precedent, and fixed the value of an absconding swarm.

At this time, a first-class carpenter received 18 pence per day, while a good "stok of bees" was worth from 1 pound to 1 pound 6 shillings, or the equivalent of about 15 days' labor.

Honey in the comb was appraised at 1 shilling 9 pence.

In the old days when Ipswich was our shore town, there came before the court, "the Hon. Judges, Mr. Symon Bradstreet, Mr. Samuell Symonds, Major General Dennison, Mr.

Arabian apiary in Algeria.

Wm. Hubbart and Maj. Wm. Hawthorne" on the bench, one Isabel Holdred, to ask protection from an "infernal" bee. This was in February, 1659, thirty years before the witchcraft trials which were held before the same court. The records say, "Isabel Holdred testifieth shee was tormented night and day and several apiticions appeared to ye deponent in the night, the first night a Humble bee. The Deponent was exceedingly affrightened and skipped to Nathan Gold, who was in the opposite chimney corner and caught hold of ye hayre of his head, and her speech was taken away for ye space of half an hour."

There is a chance for much speculation here upon which the faded and crumbling records of that early day give no light. Why was Nathan in the opposite corner? Her speech was taken away, but Nathan may have said a good deal, if she grasped his "hayre" the full half hour! We hear nothing more of the bee, but Isabel's troubles were not ended, for we find in the "Records and Files Vol. I," that she was "presented" for "unseemly carriage," the case being left to "Referrees" who "found no censure on her, as she was troubled with fits and her own husband present in the house."

One wonders if the Referee considered the "fits" or the "husband in the house" the greater excuse for her "unseemly carriage"; also, the inference from the records is that, although the bee is not mentioned again, the husband was "stung."

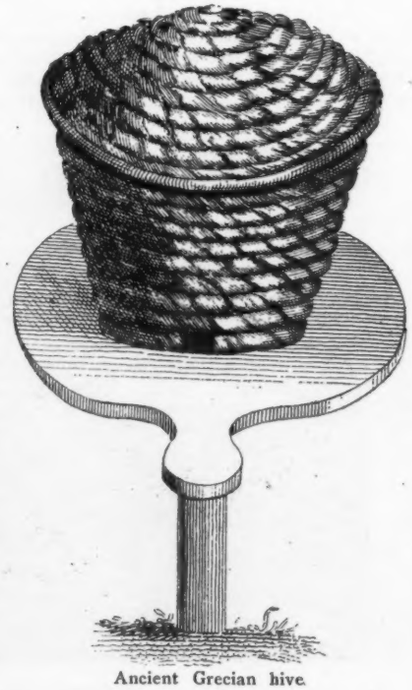
Massachusetts.

GREEK BEEKEEPING IN 1675

(From "A Journey in Greece," by George Wheeler, Esquire).

This Mountain (Hymettus) is celebrated for the best Honey in all Greece, of which it makes a great quantity to send to Constantinople, where it is much esteemed for making Sorbets. They use therefore to bring all the Honey made hereabouts, to be marked with the Mark of this Monastery of Cosbashi, to make it sell the better. We eat of it freely, finding it to be very good; and were not at all incommodated with any Gripings after it. This Mountain was not less famous in times past for Bees and admirable Honey, the Antients believing that bees were first bred here, and that all other Bees were but Colonies from this Mountain; which is so, we assured ourselves, that it must be from this part of the Mountain that the Colonies were sent; both because the Honey here made is the best, and that here they never destroy the Bees. It is of a good consistence, of a fair gold-colour, and the same quantity sweetens more water than the like quantity of any other doth; which they sufficiently experience in making Sorbets. They wondered at my Comrade, in that he preferred the white Honey of France (as that of Provence is), telling him the white Honey was raw, and not perfectly concocted, either by Nature or the Bees. Strabo, I remember, saith The best Honey of Hymettus was by the Silver Mines: But where they were is now unknown; unless hereabouts by the same reason. Now the best Argument to prove that Bees had their original from hence, is, that here they never destroy or impair the Stock of Bees in taking away their Honey. A thing which I no sooner knew, but I was inquisitive to understand their Method in Ordering the Bees; which being an Art so worthy of the Knowledge of the Curious, I shall not think it beside the purpose, to relate what I saw, and was informed to that effect, by such as had Skill in this Place.

The Hives they keep their Bees in, are made of Willows or Osiers, fashioned like our common Dust-baskets, wide at the Top and narrow at the Bottom; and plaister'd with Clay or Loam, within and without. They are set the wide end upwards, as you see here, the Tops being covered with broad, flat Sticks, are also plaister'd with Clay on the Top; and to secure them from the Weather, they cover them with a Tuft of Straw, as we do. Along each of those Sticks, the Bees fasten their Combs; so that a Comb may be taken out whole, without the least bruising, and with the greatest ease imaginable. To increase them in Spring-time, that is, in March or April, until the beginning of May, they divide them; first separating the Sticks, on which the Combs and Bees are fastened, from one another with a Knife; so taking out the first Combs and Bees together, on each side, they put them into another Basket, in the same Order as they were taken out, until they have equally divided them. After this, when they are both again accommodated with Stocks and Plaister, they set the new Basket in the Place of the old one, and the old one in some new Place. And all this they do in the middle of the day, at such time as the greatest part of the Bees are abroad; who, at their coming home, without much difficulty, by this means divide themselves equally. This Device hinders them from Swarming and flying away. In August they take out their Honey; which they do in the day-time also, while they are abroad; the Bees being thereby, they say, disturbed least. At which time they take out the Combs laden with Honey, as before; that is, beginning at each outside, and so taking away, until they have only such a quantity of Combs in the middle, as they judge will be sufficient to maintain the Bees in Winter; sweeping those Bees, that are on the Combs they take out, into the Basket again, and again covering it with new Sticks and Plaister. All that I doubt concerning the Practice of this here in England, is, that perhaps they gather a less quantity of Honey from the Bees here in England, and that, should they take the like quantity of honey from the Bees here in England, they would not leave enough to preserve them in Winter. But this hinders not much; for being less covetous, and not taking so much Honey from the poor Bees, the great encrease and multiplying of them would soon equalize, and far exceed the little Profit we make by destroying them. This is done without Smoak; wherefore the Antients call this Honey "Akapnison," **Unsmoaken Honey**; and I believe the Smoak of Sulphur, which we use, takes away very much of the Fragrancy of the Wax, and sure I am, the Honey can receive neither good Taste nor Smell from it.



Ancient Grecian hive.

FOOD SCIENCE AND THE HONEYBEE

By H. W. Sanders

The study of foods, their chemical composition, their function in life, is a branch of applied science that has made remarkable strides during the past few years, both in agricultural experimentation and in medicine. The first attempts to formulate rules and principles of feeding from a scientific view point were by no means a success, because of their endeavor to use a living organism as if it were a laboratory retort, but latterly, since the nature and functions of vitamins have become more plain, and since a greater allowance has been made for such uncontrollable factors as idiosincracies of the individual or changes in the general health of the subject and consequent variations in the ability to assimilate the chemical constituents of food, real progress has been made, and the true value of much of the patient work of the first investigators realized.

It is rather surprising that the honeybee has so far missed the attention of scientists working along this line, because this insect, in common with the rest of the order, separates the different functions of life into well-defined periods corresponding to its metamorphosis. In the first period the entire energy of the

larva is used up in growth; in the second it is consumed in the production of the organs of maturity. In the imago the food is used solely for the maintenance of bodily energy, and, during the winter, in the production of heat by muscular, not by chemical action. Consequently, in theory at least, the insect offers a fruitful field for study if the practical difficulties could be overcome. Whether this is a matter of reasonable expectation, time alone will show, but the importance of the considerations outlined above to the practical beekeeper is considerable, in view of its effect on practical apiary management.

It has been often stated by well-known beekeepers that sugar syrup affords a well-nigh ideal winter food on account of its low ash content, which is necessarily left in the intestines of the bees after the carbohydrate has been dissolved in the stomach and converted into heat through the medium of muscular energy. Honey shows a larger ash, and so must be considered inferior for purely wintering purposes. It should be borne in mind that insects have no means of building up their wasted tissues as have the higher animals, and therefore this winter food is used for one purpose only, that of supplying the energy necessary for the heat-producing activities of the cluster.

When the progress of the season, however, involves the commencement of the labors of brood-raising, the food used by the bees has a double purpose to fulfill. There is the heat necessary to "hover" the brood during chilly spring days, and there is the necessity for nourishing the larvæ, as they emerge from the eggs. There is also the feeding of the queen to produce the large amounts of eggs necessary to re-populate the hive, but so little is known of this matter that it need be only mentioned here. Undoubtedly the worker-bees feed the queen upon some food that is given in a partly or fully digested condition.

It is at this point that the spring gathering of pollen becomes of great importance. This forms the nitrogenous or protein portion of the ration, so necessary for rapid growth, and as the larva has no drain on its energies for motion, heat, or any bodily function save only that of growth, it is able to consume sufficient food to make enormous progress when judged by the standards of other organisms. Finally, when it becomes full-fed it has sufficient stored-up nourishment to enable it to elaborate the organs of the perfect bee.

Finally the insect emerges from pupation, and from then on she has no growing or repairing of her anatomy to be effected by the fuel consumed in her stomach. The sole necessity is the production of muscular energy for the work of the hive, and the heat regulation which, as stated, is purely a mechanical affair, whether it consist of hovering the brood on a cold day, or ventilating the hive on a warm one. The food that is prepared for the queen or brood is not consumed in the body of the worker, but only receives a chemical treatment there.

Translated into actual practice, therefore, the philosophy of feeding bees seems to come out somewhat like this:

1. Whenever there is brood in the hive there should be abundance of pollen, natural or artificial, and honey, as the constituents of honey apart from the pure sugar are of a protein nature, and in addition probably contain necessary vitamins.

2. When there is no brood, the food should consist of the purest saccharine matter obtainable. In practice this is usually syrup made from the best sugar. Its ash content is so low that to compare it with honey is like comparing hard and bituminous coal. The hard coal is rendered nearly all into gas during combustion and there is much less ash than with the soft coal. Similarly, the sugar burns hotter in the laboratory or furnace of the stomach and leaves less ash to trouble the bees with dysentery.

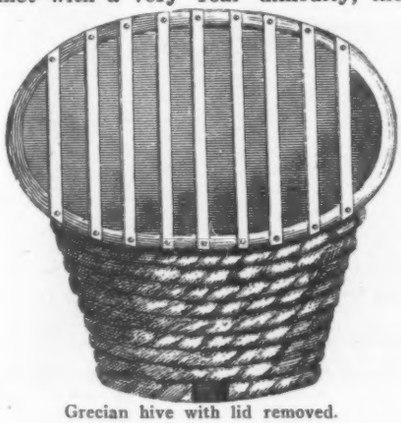
Even where cleansing flights are possible, the use of inferior food is bound to have its effect in sapping the vitality of the colony through the energy consumed in digesting and separating the actual food from the impurities and water in the food, and it is quite a question whether it would not be profitable to feed bees exclusively upon the finest honey gathered. It certainly is one factor in improving the strains of bees through breeding that does not appear to be considered. In improving other lines of stock through breeding, environment is considered as well as heredity, and every effort to give the pure-bred scion the utmost assistance in developing constitutional strength by assimilating the best of food is made. Why not in "breeding for the best" try to feed the improving race of bees in such a way as to ensure their developing under the most favorable circumstances and surroundings?

Manitoba.

MAKESHIFT HIVES

By John Prothero

Anyone advocating "Better Beekeeping" today in rural districts is met with a very real difficulty, the alarming price of good dovetailed hives in pine or cypress. There is little use in promising high dividends after the capital expenditure has been made. The bottom has fallen out of the bushel basket for the time being. The new administration is hard at work considering various methods of tinkering; you cannot get people to make what they consider to be heavy expenditures at a time when retrenchment is the first need. I consider that one is doing the large manufacturers a good turn, and not a bad one, when one takes up seriously the question of efficient makeshift hives. The larger the number of movable-frame beekeepers the greater will be the demand for good factory-made hives. Nobody likes makeshifts, although everybody enjoys showing examples of ingenuity to admiring friends. The makeshift apiary of today is the well equipped apiary of tomorrow; and tomorrow perhaps the price of a dovetailed, metal-roof hive will not be so near the price of a Pierce Arrow. By makeshift I mean the half-way house between the gum and the factory-made dovetailed hive. Get people today to fit the Langstroth frame efficiently into any old thing; that is the first step.



Grecian hive with lid removed.

Take your foot rule in hand and invade the back yard of the local store. For years I used a Kirkman's Borax Soap case as temporary hive, having discovered that the length exactly held Langstroth frames from staple to staple. It seemed culpable to me for apiarists to scatter frames around a hive propped against the sides, leaning against one another clumsily and insecurely, when this light case held the frames so well; it is better for this purpose than an empty body, having a bottom and extra depth, in addition to being lighter. With a small roll of calico over the top it is a perfect insurance against starting robbery. I kept swarms on frames in these cases when I happened to be short of equipment, and it struck me that one had here a quite efficient makeshift hive in which one could even winter bees in the South. I do not see any reason for saying discreetly "The packing cases of a well-known soap will be found to make excellent makeshift hives." Why not give this noble and beneficent firm the full benefit of the ad? I feel very strongly that no beekeeper should use any other kind of soap, that they should blacklist and blackmail any storekeeper who does not stock it. In this way we may be sure that other firms will follow suit, that the Alaska salmon canners will recognize the insistent claims of the Langstroth frame, and that storekeepers will realize that there are eight hundred thousand beekeepeers in this country.

But to retrace the subject, the beekeeper who goes through the storekeeper's back yard with foot rule in hand may make other useful discoveries. A little sawing and nailing will do wonders. With me it has become a hobby; when I see a strong dovetailed case, on a sidewalk outside a grocery, I measure it instantly. The cartridge packing cases of a Bridgeport firm

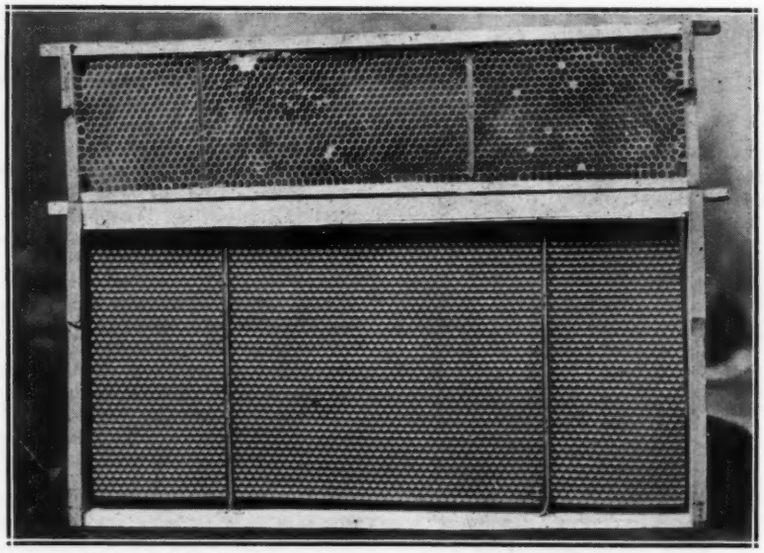
are so excellently made that if I lived in that neighborhood I would consider adopting a frame of a size to fit them; except in large cities they are not sufficiently common to make it worth while starting a cartridge case apiary. But it is different with soap, canned salmon, baking powder and similar things.

I shall bring down contempt upon my head if I recommend the small beekeeper to cut packing case material to hold Langstroth frames, to use a sheet of enameled cloth over the frames, to paint or tar cotton cloth over a rough cover, even to descend to the disgraceful use of glue in this form of carpentry. You would prefer to keep him a gum beekeeper or a non-beekeeper; I am for making him, at all costs, some sort of a movable-frame beekeeper. School teachers to whom one shows contemporary price lists say that it simply isn't practical politics to urge their charges to go in for modern equipment. They are the best authorities on this matter; we must believe what they say and find some way of turning the coming generation into movable-frame users.

The use of straw has advantages and defects. In Europe, of course, even with lumber at pre-war levels, it has always been popular. I would not for an instant advocate the use of the "skep," familiar to Americans on honey labels and nowhere else. The skep is a trifle better than the gum; that is all that can be said for it. But the use of plaited straw brood-chambers, where the straw rope is bound tightly round a skeleton of wooden lath, has much to recommend it. A British firm has for years marketed a hive of this type, known as the Buncefield. The plaiting of straw and twine is an unknown art in this country. When in France, I greatly admired the way the French truck drivers made bonnet covers of straw rope for their trucks. It was closely woven and stiff in texture, and warm and waterproof. The first attempt to make this sort of hive would probably result in something like little sister's first attempt to make biscuits, and there is a danger that they would be condemned as bum affairs; but I feel sure that anyone who had seen a snug, well-made straw-and-lath body would realize its possibilities. This is one of the things for which one requires the local craftsman, the skilled specialist who supplies local needs. It is not likely that the large firms would take it up, and it would be too tiresome for each individual beekeeper to acquire the necessary skill and practice. Unless the price of lumber shows signs of making a big descent it looks as if it might pay an inventive textile engineer to devise a rough combing and plaiting machine for straw and twine, for there are many other purposes to which it could be turned beside beehives. Nobody who has ever seen a ten-year-old skep, as hard as a board, varnished by the bees on the inside, can realize how snug and satisfactory a material it is. For the circular skep, a mid-rib of bramble is usually employed by the village maker; but for frame hives, with their angle corners, wire could be used. The British firm I mentioned uses bamboo strips.

Virginia.

(We used straw movable-frame hives years ago. They were bound with wire, and the corners were 2-inch square posts. They were really better than wood, being warm and 2 inches thick. But the mice gnawed their way through the walls in numerous instances. Can any one suggest a remedy?—Editor.)



Metal frame supports invented by Harry Hartman, of Braddyville, Iowa. This is somewhat similar to Doctor Miller's wood splints, except that it is made of metal and fastened to both top and bottom of frame.

DRONE-COMB AND ITS (AB)USE

By F. Greiner

The progressive honey producer of today has no use for drone-comb in the brood-nests of his hives. In the bee books and bee periodicals we are admonished to "cut it out," both literally and figuratively, and it is well to do so; we are agreed on that. In earlier issued bee books, as well as in the latest, drone-comb has been given the name "store comb," whether merited or not. Indeed, we very often find the nicest pieces of honey even in bee trees, of drone size. Theoretically, it is cheaper, or more economical to build drone-comb than worker-comb; the larger the cells the less material required. When combs of the large-sized cells are whirled around in the honey extractor the honey comes out easier and cleaner, less adhering to the cell-walls. This is true, and from our standpoint it might be considered an advantage to have drone-comb used in our supers, in particular the extracting supers. The bees, however, are not guided by their sense of economy when it comes to building comb to store their honey, and build both worker and drone-comb haphazard. They do this even when we may have eliminated all drone-comb from their brood-chamber by the use of full sheets of comb-foundation, and it would seem that they would, under these circumstances, in their desperation, construct nothing but the large cells. The large majority of us beekeepers have for many years used full sheets of comb-foundation in our brood-frames, yet we had to cull out many otherwise nice combs on account of the foundation having sagged to an extent to make them, for all practical purposes, drone-comb; and many of these have been used in the extracting supers. It is about time that all these combs containing any unsuitable cells, i. e., of drone size, be culled out again and rendered into wax. Why? Are we not using queen excluders? In answer I want to say that I have, as others, used drone-combs over excluders for years, and while I have seen some drone-comb filled with honey, more often these combs have been kept free from honey very persistently by the bees, expecting the queen would find them and they might rear a nice lot of drones there. Alas, sometimes a queen has found a defect in the excluder and squeezed through and did what was expected of her, but not to our satisfaction. Much valuable comb space has thus been wasted by our bees for years, and it is high time, as I said before, to put a stop to it. We cannot keep our extracting supers as free from drone-comb as our brood-chambers. Better render all defective combs into wax and substitute comb-foundation instead. May I, right here, give vent to my feelings, expressing my determination in this resolution to take more pains in the future, to have more perfect brood-combs, to have all foundation-filled frames built out without any sagging, having them built out, if possible, down to the bottom-bar? This may mean better wiring, having frames built out in upper stories, etc. I want to cite a mistake I made at the time when I adopted the sectional hive years ago, a mistake that has cost me dearly, from which I am still suffering

undesirable results. The frames in these hives were planned for half-depth Langstroth size and were 4¼ inches in the clear. I bought the Langstroth size comb-foundation and cut the sheets in two lengthwise. Be it, that the foundation received had been scantily cut or for other reason, at any rate, when these shallow frames were filled with this foundation it left a space above the bottom-bars from three-eighths to one-half inch. In such shallow frames, even without wiring, sagging would be negligible, when medium foundation is used. My bees very cleverly filled out my frames with a row or two of drone-cells at the bottom. What this means when you want to inspect brood sections from the underside, or drive the bees downward or upward, as the case may demand, those will realize who are familiar with the management of sectional hives. The sheets of foundation should almost touch the bottom of such shallow frames as these were.

New York.

COST OF PRODUCTION OF HONEY CROP

By John Burgschat

Twenty-five colonies in yard.

Five of these were not used for surplus, but for increase and to rear queens.

Twenty colonies were run for surplus.

Fifteen of these were 2-lb. packages purchased in the South in May.

Cost of 20 hives, including painting and foundation	$118.00
Cost of 50 comb-honey supers	220.00
Cost of 50 extracting supers (second-hand)	20.00
Cost of extractor (one-half interest)	15.00
Cost of bees	100.00
Total cost of equipment	$473.00
Interest on investment of equipment at 7 per cent	$ 33.11
Depreciation on cost of equipment at 10 per cent	47.30
Total expense of use of equipment	$ 80.41
Expense of use of equipment from above	$ 80.41
Cost of foundation for supers	12.50
Cost of cartons for sections	22.00
Cost of glass containers	20.00
Cost of 1,600 sections	18.75
Total expense to produce 2,100 pounds of honey	$153.66
Gross receipts of 1,600 sections	$450.00
Gross receipts for 600 lbs. extracted	210.00
Gross receipts for total	$660.00
Total cost of production	153.66
Net profit for labor	$506.34

Labor, about an average of four hours per week for seven months.

Used practically 100 pounds for home use.

SOME KANSAS NOTES

By Frank Van Haltern

Hive records properly kept are often quite valuable in pointing out mistakes and making it possible to plan ahead with some certainty of success. The following figures, obtained from our records, are based on estimates made by examinations in the fall and spring:

Between October, 1920, and April 20 to 26, 1921, when they were unpacked, 156 colonies consumed an average of 24 pounds of stores, ranging from 13 to 35 pounds. This would seem to show that the minimum allowance should be not less than 40 pounds for the winter, so as to have some honey in the hive for spring brood-rearing.

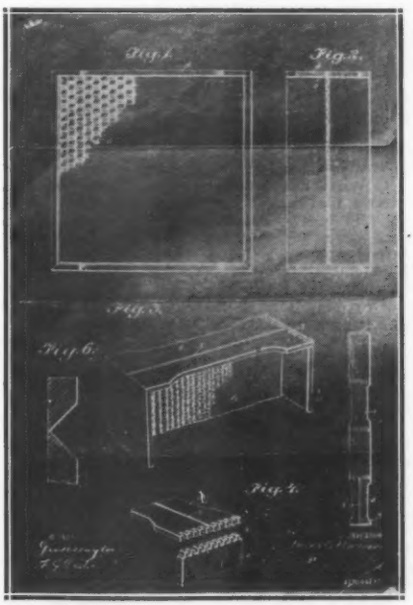
Ninety-six young queens averaged 3.97 frames of brood, in the spring, as against 3.75 frames for 30 old queens. These frames were mostly modified Dadant. The colonies with young queens averaged one pound of stores more, in the spring, than those with old queens. The young queens do not show up strong here. However, the time when the old queens fell down was in the heavy brood-rearing season.

One hundred and twelve colonies with five pounds or more of stores in the hive, at time of unpacking, averaged 4.1 frames of brood, while 44 that had less than five pounds averaged 3 frames of brood. This shows that as the stores are reduced, brood-rearing is restricted.

In one year, 17 colonies wintered on modified Dadant frames averaged 3.6 frames of brood in April, while 32 colonies on Langstroth frames averaged 3.1 frames of brood. The colonies on the deep frames consumed an average of 23.7 pounds of stores, while those on shallow frames used 24 pounds, each, during the winter. I am using the number of frames of brood as an index of the number of bees in the hive, and therefore of the strength of the colony. In the cool days of spring there is a close relation between the number of bees and the amount of brood. In the heat of summer the amount of brood, especially in small colonies, may be large in proportion to the number of mature bees. Results in this yard seem to indicate that the deep frame is a little the best for winter.

Fifty colonies, at one outyard, were packed in two long rows, the hives being placed close side by side, and observations made to determine the amount of drifting during the winter. So far as we could tell, there was no drifting, the strength of different colonies running about the same as the hives that were packed in pairs. However, the entrances were all distinctly separated from each other and plenty of markers, such as stones and sticks, placed in the front.

Kansas.



The split section on which patent was recently issued to Harry Hartman, of Braddyville, Ia., as mentioned in a recent issue.

BEES KILLED BY SPRAY POISON

Dear Mr. Dadant:

I wish to inform you that last week two farmers here in this vicinity sprayed their apple orchards, just as the trees were going into full bloom, and as a consequence fully two-thirds of my bees were killed by this poison. Two more smaller bee yards were ruined. These farmers were told again and again not to spray while in full bloom, but pleading and even giving them honey was of no use. The loss to me, figured at the lowest, is at least $500, besides the loss of the honey crop, as no matter what I do, these bees cannot breed up in time for the clover flow. Besides many colonies are dead outright. It makes it all the harder for us, as we made our living from the bees. Is there no law, or cannot something be done to protect our bees? If this keeps on we might as well go out of the bee business. I wish, Mr. Dadant, you could have seen how the bees rolled out of the hives and how they suffered, and the whole bee yard was literally covered with dead and dying bees. They were never in finer condition than they were this spring.

G. A. Barbisch.

Minnesota.

(This is a very unfortunate affair. Those farmers ought to be punished, and there is a possibility that you might obtain damages, if the injury can be proved.

We tried to get a State law passed in Illinois upon spraying, a few years ago. But we had no positive evidence to produce, and the Committee of the Legislature refused to do anything until evidence could be produced. They argued that it was against the fruit grower's interest as well as the beekeeper's, to spray during bloom, and that is true, for there is more or less damage done to the pollen and to the pistil of the blossom by using poisons in spraying during bloom. Besides, the bees are useful in fertilizing

the blossoms. Those farmers were not only wicked, but foolish, disregarding their own interests, under a mistaken idea that spraying during bloom would be useful.

Now would be a good time to get a law passed in Minnesota, especially if you could bring forward two or three similar cases. We would advise you to consult the State Apiarist at the Minnesota Agricultural College. Something should be done, and can be done, to prevent such another silly action in future.—Ed.)

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Number of Supers Per Hive

How many supers with the six and a quarter inch frames for extracting is it necessary to have for the modified Dadant hives, with good strong colonies in them? I am changing from the 8-frame to the modified. IOWA.

Answer.—We figure on the necessity of having an average of two supers per colony. But we have had as many as 5 supers filled by very strong colonies. In fact, we would hesitate to tell how much honey we have secured in this way from some good colonies, for fear of being disbelieved

You will understand, of course, that much depends upon the locality and the season. But we know that you will secure tremendous crops, by the method we recommend.

We usually extract the spring crop (clover crop) before the summer crop comes. Sometimes we have been compelled to extract in the middle of the clover crop, because we disliked the idea of using more than 2 or 3 supers per colony.

Poor Queen

I have a colony with an extra large leather queen whose brood does not seem to hatch good. This morning I found 2 and 3 eggs in a cell. What shall I do? WISCONSIN.

Answer.—I am of the opinion that your queen is deficient and had better be replaced. It is an unusual thing. But such things happen. It might even be that she does not lay at all and that those 2 or 3 eggs in a cell have been laid by laying workers.

A good experiment would be to place that queen in an observing hive—a hive with only one comb, and glass on both sides—and watch her. An observing hive is a delight, if you have any spare time at all. You can learn more in two weeks with one of them than you can learn in a whole year by reading bee books or magazines.

Increase

1. Please advise which you find to be the best, natural swarming or artificial swarming? What is the best plan of artificial swarming?

2. What do you think of the "Demaree Plan" given in the May number of the American Bee Journal, on page 183? If this plan is used, how long is it necessary to leave the upper hive on above the other hive and the super, and what time is the best to remove the top hive? IOWA.

Answers.—1. I prefer artificial swarming because we can make just as many or as few as convenience indicates. It is not always possible to prevent natural swarming, but with the proper management there is very little of it.

2. The Demaree plan is good. It has been thoroughly tried, and although we do not use it with our deep-frame hives, yet we would recommend it for those who use Langstroth 10-frame or 8-frame hives. If you wish to divide with this plan, a good time to divide is when the young queen is about to hatch, or has just hatched, in the upper story. Then remove the lower story with the old queen and put this in a new spot, or place the two hives side by side on the old spot. In fact, you may do different ways, provided you see to it that both hives have enough bees and brood.

Ventilation

I have made a practice of using a screen on top of my hives, in extremely warm weather, made of ordinary screen wire, and raising one end of the hive top on this screen to insure good ventilation. I am told that this is bad practice and that it is much better to merely raise the bottom of hives on blocks of 1 inch thickness. My hives have no shade except extra covering of boards that I put on when days are very hot. OKLAHOMA.

Answer.—That is probably a matter of locality. As a rule, however, we would not recommend the practice, because it requires your attention, should the weather turn cool. In some countries it would not be possible to do that at all. Even here, when we practiced giving upper ventilation, we found that the bees soon used their utmost endeavors to close it up, by bringing propolis.

In extremely hot days, we found this practice beneficial, as it enabled the bees to enter the hive instead of clustering outside. But I doubt that there be many nights when the bees would not prefer to have only bottom openings.

Using straw mats, as we do, laid over an oil cloth at the top of the hive, we find that, when the oil cloth has been cut by the bees, the light amount of ventilation which is allowed to pass through the mat causes the bees to avoid placing any honey next to that spot There may be some other cause for that than undesired ventilation, but it indicates a faulty condition. Upon the whole, if we can make the bees comfortable by a large amount of bottom ventilation, we much prefer it.

Barrels, Virgins, Vinegar, Etc.

1. What has been your experience in using barrels for honey? What kind are the handiest and best? I am able to get good barrels that have had molasses in them. Are they safe for honey? How can they be cleaned? How can a barrel be treated and know for sure it is safe for honey? I expect to use them for storing honey, as I do not take time to bottle it during extracting.

2. I expect to rear what queens I will need this season, but I am puzzled how to manage virgin queens that have emerged in nursery cages and get them successfully introduced and laying.

3. Please suggest a good name for a side line apiary. I live in the corn belt region where mixed farming is generally carried on

4. In the February American Bee Journal, page 51, "The Honey Regions of Indiana" was very interesting. Can we not get a map worked out showing the most important honey regions in Illinois? I would like to get one if possible. Does not our State lag in beekeeping?

5. In a back number of the American Bee Journal a very good direction was given for making honey vinegar. I am unable to find it. Please tell me where to look, or give me the directions how to proceed. ILLINOIS.

Answers.—1. Molasses and syrup barrels have never given us satisfaction. They are usually 6-hoop barrels and made of soft wood. They shrink and swell too readily with the changes of atmospheric moisture, it is possible, however, that some of them might be used if very dry when emptied of the syrup and kept dry afterwards. Drain them out thoroughly, in hot weather, and avoid using much water in cleaning them out. We use alcohol barrels.

2. The virgin queens are much more difficult to introduce than laying queens. For this reason we always hatch our young queens in nuclei and have them fertilized before using them. If you must introduce them, give them to small colonies containing mainly young bees, and do the introducing as early as possible after the queen emerges from the cell.

3. We call our outapiaries by the name of the farm or the farmer at whose farm they are located. If you want a fancy name, better have the ladies select it. They are better at it than we are.

4. Yes, our State is rather lagging behind in beekeeping. Yet we have everything that could make it a leader. We may be able to make out such a map as you suggest within a year or so.

5. The method for making honey vinegar was given in September, 1915, page 314; October, 1917, page 345; and a method to make over insufficiently fermented vinegar, in August, 1918, page 277.

Unusual Conditions

Looking through a few colonies of bees belonging to a lady friend, one colony was found in which there was no brood, eggs or any evidence that there had been queen-cells. I went carefully over the combs twice, but could find nothing resembling a queen.

A frame of eggs and larvæ was taken from another colony and inserted in the middle of the brood nest. Making a visit a week later, I expected to find cells built. Not a one; brood nearly all sealed. The frames were given the double go-over again. No eggs. No queen to be found.

Again a frame of eggs and larvæ of all ages was given, and upon my next visit, about a week later, the same conditions were found as upon the previous visit. A search was made again. No eggs or queen.

A few days later a wild swarm of hybrids was caught and was run into this hive with no preliminaries whatever. They were welcomed, black queen and all. Was this bunch trying to commit suicide? NEW YORK.

Answer.—Likely the colony in question was discouraged, and for that reason inactive. It is a rare case of neglect, on the part of the workers. It tends to indicate that there were no young workers among them and that they were at a loss to produce pap or jelly. Yet, after two introductions of brood there should have been enough young bees hatched to take an interest in queen-rearing.

Bee Trees, Size of Hives

1. Could you tell me what shares are customary for cutting bee trees, where you do all the work yourself (wanting the bees yourself)?

2. Does white clover bloom the first year after planting?

3. Which is the best for comb honey, 8 or 10-frame hives? KANSAS.

Answers.—1. I have never seen this matter settled in practice. I have cut only two or three bee trees in my young days, and in each case the owner of the land simply asked that I cut up the tree into useful lengths, as his pay. After all, we are not allowed to cut a tree on another man's land without his consent.

A little book entitled "Bee Hunting," which we think is now out of print, says this about the rights of a bee hunter:

"Merely finding a *bee* on the land of an-

other and marking the tree does not vest the property of the bees in the finder. *They do not become private property until they are in the hive.* True sportsmen do not think of going to law for adjustment of these matters, but rather depend on that fraternal spirit by which all questions relating to ownership are settled amicably."

So this matter must be settled amicably. As a rule, the owner of the land will not care for a share of the bees, and probably a share of the honey found would be acceptable. Sometimes there is little honey, and the bees are the only valuable property in the tree, outside of the wood.

2. White clover generally blooms in the latter part of the season in which it has been sown. Its full bloom occurs only the second year.

3. Dr. C. C. Miller succeeded well with 8-frame hives, by using two hive-bodies for breeding until the crop was on, when he removed one of them, leaving the best brood-combs in the one hive and adding a sufficient number of supers. But this requires many manipulations. Better have 10-frame hives.

Distance Bees Fly

How far will a bee go to gather honey? I live in town and there are 80 acres of sweet clover north of town. Just a mile west is another large field, but it is 3 miles, and south another 40 acres a mile and a half away. Is this too far away for my bees?

NEBRASKA.

Answer.—There is a disagreement among leading beekeepers as to how far bees will go to gather honey. Doolittle and one or two others claimed that bees would readily go 7 or 8 miles, while many others, as well as ourselves, believe that 2 or 3 miles is the extent of their flight for honey, except in extraordinary circumstances. It is probable that, if bees are baited to a spot by finding flowers along the way, they may be drawn quite a distance.

We would suggest that your bees would go to the two fields that are the closest. If you find them at the farthest field, we would like to hear about it. They certainly fly farther when they follow a valley than when they have to go over hills, especially if the hills are covered with timber.

Two Queens in One Hive

Here is my experience in finding two queens in one 10-frame hive: This colony was one of the strongest in the apiary, a good laying queen present; later, on examining, I cut cells. In next examination I found two queens and could not tell if one was an old queen or not; one on each side of hive, on comb of eggs. I took out one queen and frame of bees and put a full sheet of foundation near the center. On later examination I found the foundation had not been drawn out; the hive was fairly filled with eggs and brood in all stages, with a fine queen on each side. The first queen which I took from this hive did not lay any eggs, although she would go through the act of backing into a cell.

I believe that the flow of nectar stopped, so the bees did not draw out the foundation, and this acted as a division-board, causing the bees to rear a third queen, or else there were three queen present and I found only two What do you think of it? I have two queens left of this hive yet. ILLINOIS.

Answer.—The probability is that you had taken out the old queen and that there had been two queens reared to take her place. Your surmise that the sheet of foundation acted as a division-board is probably correct.

New Things That Are Old

For want of reading the ancients, one often gives as a novelty something that was already the town talk in the days of Aristotle.—Huber, February, 1805.

ODDS AND ENDS

New Sweet Clover Bulletin

A bulletin entitled "Annual White Sweet Clover and Strains of the Biennial Form," has recently been issued from the press of the U. S. Department of Agriculture. It is written by A. J. Pieters and L. W. Kephart. This bulletin gives some interesting information about the annual white sweet clover, which has attracted such wide attention during recent months, and also regarding the early blooming variety of the biennial form called "Grundy County Sweet Clover." This last is the same which the American Bee Journal has distributed free samples of so widely. We have also sent out numerous samples of the annual as well.

We would suggest that any of our readers interested in these new sweet clovers write at once the U. S. Department of Agriculture and ask for Department Circular 169.

A Good Record

L. A. Coblentz and wife, of Rigby, Idaho, have sold directly to the consumer more than 100,000 pounds of honey since August, 1920, at good prices. They have not been content with the low wholesale prices now offered, neither have they been willing to sell their honey at retail for less than the prevailing retail prices. By going directly to the consumer with their product they have increased their income in proportion by adding the profit of selling to the profit of production.

Linen From Sweet Clover

A newspaper clipping reaching this office refers to the sweet clover plant as a possible source of fibre suitable for a substitute for linen. The fibre is described as long and silky as well as strong enough to insure good wearing qualities in the finished cloth. Once despised, sweet clover is proving its value as a forage crop and soil builder to such an extent as to insure its permanent place in American agriculture. Should it prove to be valuable for fibre as well, its cultivation would be further extended.

A New Inspector for Utah

Because of ill health, Frank B. Terriberry asked to be relieved of the duties as State Inspector of Apiaries in Utah, and Dan H. Hillman has been appointed in his stead. Mr. Hillman is already at work.

Apis Fasciata

The October-April number of the Bee World contains an article upon the Egyptian bee (**Apis fasciata**) which is worth the price of the year's subscription to anyone who desires to study foreign races. I doubt that so exhaustive an article concerning that bee was ever published. It was translated from "Der Deutsche Imker" by Miss Annie D. Betts.

The descriptions and explanations given concerning this bee show conclusively that it is not fitted for our climate, for "the habit of not collecting stores has become a plainly hereditary quality." The reason is that, in Egypt, the bees do not need it.

The Joy of Beekeeping

"The joy of beekeeping is not in pounds, shillings and pennies. One loves the little insects for what they are and what they do. They love flowers, so should we; they love order, so should we; they love cleanliness, so should we; and since all this is so, may we never use the delicate winged creatures merely as an excuse for advertising, and may the "Bee World" and its sister periodicals ever open their pages to all the joys that soulful beekeeping brings in its train." (Rev. E. F. Hemming in "Bee World," page 9.)

Wisconsin Grading Law

Some months ago we made mention of the fact that Wisconsin requires all honey sold in the State to be graded and stamped with the grade, or labelled "ungraded." Newspaper clippings received at this office convey the news that two retail grocers have recently been fined for selling honey without such label and that the beekeepers who sold the honey to the grocers are also in line for similar treatment.

A Valuable Publication

The first annual report of the Division of Apiculture of the State of Washington has recently come to the editor's desk. A. L. Melander, State Entomologist, has the beekeeping work in charge and in this his first official report has brought together a large amount of information of value to the beekeeper. The report contains 119 pages and gives a splendid outline of Washington beekeeping conditions. Almost every question presenting itself relating to that State is answered somewhere in the book. An extended list of the honey flora in the various districts is a valuable feature.

This publication is distributed free to residents of Washington and sold at 40 cents per copy to others. It can be obtained from Dr. A. L. Melander. State Entomologist, Pullman Wash.

An Interesting Report

Through the kindness of A. H. E. Wood, we have recently received a copy of the report of the Aberdeenshire and Kincardinshire Beekeepers' Association, of Scotland. It shows a wonderful growth from 95 members in 1910, to 1,646 in 1920. With the exception of one year during the war, there has been an increase in membership with every report, and a great advance since the close of the conflict. Eigthy-seven branch organizations are listed with the list of members of each.

When the small area represented is considered, the showing is remarkable and much beyond that of any similar organization in America. The Association conducts numerous educational projects, holding exhibitions, maintaining a library for the use of

members, sending out experts to render assistance, and similar activities.

Bad Spring in Vermont

It has been a hard row for the bees in Northern Vermont this spring. We have been dried out and frozen up. No fruit bloom, and a small stand of dandelions made it necessary to feed heavily to get the bees up to full strength. (May 19).

C. H. Carpenter.

Third Beekeepers' Chautauqua

Prof. H. F. Wilson, of the Wisconsin State University, announces that their third annual beekeepers' summer meeting will be held at Chippewa Falls from August 15 to 20. In addition to a number of prominent Wisconsin beekeepers at least three speakers are expected from outside the State. Those so far announced are Dr. E. F. Phillips, of Washington; E. R. Root, of Ohio, and C. P. Dadant, senior editor of this Journal.

The previous summer meetings have been very interesting and successful, and a good attendance is expected at Chippewa Falls.

Stingless Bees of Central America

"Leaving Santa Cruz, our trail led northward, and a few minutes after leaving town we crossed a small river which was of considerable size at that time, but it completely dries up in the dry season. We passed several palm-thatched huts along the roadside, and many of them had hollow logs about 4 feet long hanging to the roofs of the huts, and out of the end small bees could be seen to enter and leave. We wondered why the children did not get stung, but learned that the bees have no stings. They are about the size of large house flies and have a pretty striped body, but no sting. The hives are made of hollow logs suspended to the tops of the huts to keep the ants from eating the honey. A board is stuck into the end and a hole about an inch in diameter in the center is used for the exit. When it is desired to rob the hive, the board is removed and the honey taken out, and then it is replaced as before."—Onward, San Jose, Costa Rica, March, 1921.)

To Paint Foundation

To paint beeswax on foundation to furnish additional support, I use a small atomizer made of metal. It sends the finest spray of wax. I use it also on aluminum combs. This machine was used for spraying "amberine," which is made mostly of beeswax, to make an artificial skin over bad burns.—Lillian E. Bland, British Columbia.

Pollen Depositing

What a delight it is to read a writer like John Burroughs! He can give you a new idea of something you have seen before. Listen:

"When a bee brings pollen into the hive, he advances to the cell in which it is deposited and kicks it off as one might his overalls or rubber boots; making one foot help the other. Then he walks off without ever looking behind him; another bee, one of the indoor hands, comes along and rams it down with his head and packs it into the cell as the dairy maid packs butter into a firkin."—The Pastoral Bees.

Burroughs, like Roosevelt, was a universal nature observer, and his observations are nearly always correctly rendered, but with an artless simplicity which appeals to the casual reader and which is to be envied.

Keeping Quality of Beeswax

Mr. James Johnson, of Pocahontas, Ark., sends us a sample of beeswax rendered at Galena, Ohio, in 1880, by Mrs. Joe Scratz, with the question as to how long it would keep. This sample is apparently not different, after 41 years, from wax rendered last year. As far as we know, there is no reason why beeswax should not be as good after a thousand years, if kept in a clean, dry place. In fact we understand that wax that was much older than that has been recovered from ancient cities.

New York Reports

New York produced 3,223,323 pounds of honey in 1919. Number of colonies has decreased from 156,360 in 1909, to 127,858 in 1919. The per colony average for 1919 was 25 pounds.

Tongue and Sting

Anger a woman, you shall learn the length of her tongue; vex a bee, it will give you the length of its sting. Offer sweet words and things to either, you shall enjoy peace.—(R. Stanistreet, in Irish Bee Journal).

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less that 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

QUEENS ON APPROVAL—Bees by package or colony. Tested queen, $2; select untested, $1.50; all other grades, $1. Bees without queen, 1 lb., $3; 2 lbs., $5; colony, $10.
Birdie M. Hartle,
924 Pleasant St., Reynoldsville, Pa.

MY famous three-banded Italian queens, $1.50 each, 6 for $8, after June 1.
J. W. Romberger, Apiarist,
3113 Locust St., St. Joseph, Mo.

QUEENS ON APPROVAL—Bees by package or colony. Tested queens, $2; select untested, $1.50. All other grades $1. Bees without queen, 1 pound, $3; 2 pounds, $5; colony, $10. A. M. Applegate,
840 Main St., Reynoldsville, Pa.

SIMMONS QUEENS, bees and nuclei, goldens and three-band.
Fairmount Apiary, Livingston, N. Y.

HARDY ITALIAN QUEENS, $1 each.
W. G. Lauver, Middletown, Pa.

FOR SALE—Unsurpassed Italian queens, ready June 1; untested, $1.50; 6, $7.50; 12, $14; 50, $55; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out.
J. D. Harrah, Freewater, Oregon.

FOR SALE—Hardy northern bred Italian queens and bees, each and every queen warranted satisfactory. For prices and further information write for circular.
H. G. Quirin, Bellevue, Ohio.

BEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigreed breeding stock.
Elton Warner, Asheville, N. C.

SWARTS' Golden queens produce golden bees of the highest quality. Untested, $1.50 each, 6 for $8. Satisfaction guaranteed.
D. L. Swarts, Lancaster, Ohio, Rt. 2.

FOR SALE—Leather colored Italian queens, tested, until June 1, $2.50; after, $2. Untested, $1.25; 12, $13. Root's goods at Root's prices. A. W. Yates,
15 Chapman St., Hartford, Conn.

FOR SALE—Root's strain of golden and leather-colored Italian queens; bees by the pound and nuclei. Untested queens, $1.50 each; select untested, $2 each; tested, $2.50 each; select tested, $3 each. For larger lots write. Circular free. A. J. Pinard,
440 N. 6th St., San Jose, Calif.

WE are booking orders for our golden Italian queens for spring delivery after April 15. Untested queens, 1, $1.50; doz., $15; select untested queens, 1, $1.75; doz., $18; virgin queens, 1, 75c; doz., $9; tested queens, 1, $3; doz., $36. Safe arrival guaranteed.
Tillery Brothers, Georgiana, Ala.

BOOK YOUR ORDERS for QUEENS now—Goldens, $2; tested, $3; banded, $1.50; tested $2.50; six or more, 10 per cent less.
Clover Leaf Apiaries, Wahoo, Neb.

EDSON APIARIES now booking orders for queen bees for delivery during season of 1921. Prices: One untested queen, $1.75; 50 untested queens, $57.50; 100 untested queens, $100. Orders filled in rotation; first shipments March 1, 1921.
Edson Apiaries, Gridley, Calif.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

GOLDEN and 3-banded Italian queens; tested, $1.25; untested, $1. No disease. Safe delivery and satisfaction guaranteed.
C. B. Bankston, Buffalo, Texas, Box 65.

HIGH GRADE ITALIAN QUEENS—Send for catalog.
Jay Smith, R. 3, Vincennes, Ind.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere.
Nueces County Apiaries, Calallen, Texas,
E. B. Ault, Prop.

FOR SALE—Golden Italian queens, tested queen, $3; untested queen, $1.25.
J. F. Michael, Winchester, Ind.

WILL SHIP a few choice queens with frames of brood, $4 each. Jes Dalton,
Bordelonville, La.

FOR SALE—Golden or 3-banded queens, untested only. Safe arrival and satisfaction guaranteed. Prices till July 15: One, $1.50; six, $8; dozen, $15.
Ross B. Scott, La Grange, Ind.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3; virgins, imported mothers, 50c. F. M. Russell, Roxzury, Ohio.

PRITCHARD QUEENS—(Three-banded Italians) price, untested, $1.50; 6 for $8; select untested, $1.75; 6 for $9.50. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare. Write for prices. Queens clipped free of charge on request. Acknowledgement and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired, otherwise orders will be filled in rotation.
Arlie Pritchard, Rt. 3, Medina, Ohio.

QUEENS—3-banded Italian, select untested, $1.25 each; tested, $2 each.
Carl L. Wilson, 2010 S. Boots St., Marion, Ind.

CARNIOLANS—Gentle, prolific, wonderful honey gatherers. Descriptive circular free. Untested queens, $1.50 each; $17 per dozen. July is an excellent time to requeen.
A. G. Hann, Glen Gardner, N. J.

HIGH QUALITY QUEENS at reduced prices. Three-banded Italians, reared from best hustlers, non-swarming, gentle and prolific. Can ship by return mail. Satisfaction guaranteed. Health certificate with each shipment. Untested, 1 to 10, $1 each; over 10, 90c each. Select untested, 1 to 10, $1.25 each; over 10 $1.15 each. Tested, $1.75 each
Frank Bornhoffer, Rt. 17, Mt. Washington, O.

TRY my Caucasian queens, $1.25 each; hybrids 35c each. Peter Schaffhauser,
Havelock, N. C.

QUEENS from imported mothers after July 1, untested, $1.35; 6, $8; 12, $15.50. Tested, $2. Lewis beeware at new prices. Catalog free. R. Kramske,
1104 Victor St., St. Louis, Mo.

SELECT QUEENS only. Three-band and leather colored Italians. Tested, $2.50; untested, $1.25 each.
Geo. W. Coltrin & Son, Mathis, Texas.

FOR SALE—Leather Italian queen, untested, $1; select untested, $1.25; one to three-frame nuclei, $3.75 to $5. Three-pound package bees, $4, without queens.
Tupelo Honey Co., Columbia, Ala.

ITALIAN QUEENS, $1 each, or $10 per doz., after June 1. Will book a few more three-frame nuclei of black or hybrid bees with Italian queen, for delivery after June 15, at $5 each, or 3 lbs. bees on frame of honey for $4.25. These will be fine to winter for early spring work. Otto Diestel, Elza, Ga.

DAY-OLD QUEENS—1, 50c; 100, $50; 500, $250. Untested queens, $1 each. High quality 3-banded Italians. Mailed in safety introducing cages. Delivery and satisfaction guaranteed in U. S. and Canada. Information in circular. Order early.
James McKee, Riverside, Calif.

HUMMER QUEENS—Untested, $1 each, $9 per dozen. Tested $1.50 each, $15 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old price.
Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Golden Italian queens, untested, $1.15, 6 for $6.50; 12 or more, $1 each; tested, $2 each; select tested, $3 each; extra select tested, $4 each. No bees for sale.
D. T. Gaster, Randleman, R. D. 2, N. C.

FOR SALE—Achord queens, 1 and 2 years old, 50c each.
W. A. Latshaw, Clarion, Mich.

FOR SALE—3-banded Italian queens, untested $1.25 each; 6, $6.50; 12, $12. Select untested, $1.50 each. Satisfaction guaranteed.
W. T. Perdue & Sons,
Rt. No. 1, Fort Deposit, Ala.

FOR SALE—Golden Italian queens, untested, 1, $1.25; 6 $7,
E. A. Simmons, Greenville, Ala.

THREE-BAND and GOLDEN QUEENS—Reared in separate yards. Order from us and get pure stock for your summer and fall requeening. At our special price, beginning July 1, untested, $1.50 each; 25 at $1.25 each; tested, $2.50 each. We have a good number ready for shipment and will fill your order promptly. Dr. White Bee Co.,
Sandia, Texas.

FOR SALE—About 300 colonies of bees in 8 and 10-frame hives, together with full equipment; good territory and no disease.
Elton S. Stinson, Rt. 2, Huston, Idaho.

YOU CAN SAVE queens by using All Right push-in comb introducing cage, 25c, post paid. O. S. Rexford, Winsted, Conn.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price after July 1, $1.25 each; one dozen or more, $1 each. Package bees a specialty. Send for circular.
J. H. Haughey Co., Berrien Springs, Mich.

CHOICE ITALIANS—Select queens, tested, $2.50; untested, $1.25 each.
Geo. W. Coltrin & Son, Mathis, Texas.

BRED strictly from the Dr. Miller granddaughter queens, one for $1.25, 6 for $7.25, 12 for $14. Selects 25c each higher. Tested just double price of untested. Breeders $5, select breeders $7.50 to $10 each, the best breeders $15 each. One frame nucleus with breeder for $1 extra.
Curd Walker, Jellico, Tenn.

QUEEN BEES—Allen's 3-banded Italians, disease free; the ones that get results. Price, each, $1.50. J. H. Allen,
Orr Station, Anderson, S. C.

FOR SALE—Golden queens, untested, $1.25; tested, $1.50; breeders, $5.
J. B. Marshall & Son,
Rosedale Apiaries, Big Bend, La.

FOR SALE—Italian queens, untested, 1 for $1.25, 6 for $7, 12 for $13.50. Tested, $2. Mismated queens will be replaced if returned in 30 days; dead queens will be replaced if returned by return mail. I have tested breeder from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers.
R. B. Grout, Jamaica, Vt.

FOR SALE—Burleson's three-banded Italian queens. The kind of bees that get the goods. Guaranteed to please or money back. For balance of season as follows: 1 select untested queen, $1.25, 6 for $7, 12 for $13.50, 100 or more $1 each. Send all orders, together with remittance, to J. W. Seay, manager, Mathis, Texas.
T. W. Burleson, Waxahachie, Texas.

FOR SALE—Famous strain of queens of Geo. B. Howe, A. I. Root, Jno. M. Davis three-banded bees, and we also sell extra fine goldens, bees that are bees, both in beauty and wintering, and disease-resisting; not surpassed for honey-gathering, or at least we have not been able to find any that were their superior. Untested, 1 queen, $2.50; 6, $12; 12 queens, $20; 25 queens, $40; 50 queens, $70. Try our queens. Also, we shall sell 2-lb. packages, 3-lb. packages with queens for 1922. We try and give prompt service; queens by return mail if we possibly can do so.
H. B. Murray, Liberty, N. C.

FOR REQUEENING use Williams' heavy laying Italian queens; they produce hardy, hustling three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, $1.25, 6 for $6.50, 12 or more $1 each; tested, $2. Satisfaction guaranteed.
P. M. Williams, Ft. Deposit, Ala.

FOR SALE—Three-banded Italian queens, untested, $1.25 each; 6, $7.50; 12, $14. Tested queens, $2.50 each; 6, $15. The above queens are select stock. Safe arrival and satisfaction guaranteed.
Rob't B. Spicer, Wharton, N. J.

COLONIES of Italian bees in good standard hives. A-1 in all respects. Write for prices. Satisfaction guaranteed.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Vigorous leather-colored Italian queens, famous three-banded stock; untested queens, $2 each; tested, $3; untested queens per dozen, $20. Order early.
C. M. Elfer, St. Rose, La.

FOR SALE—Highest grade three-banded Italian queens. Select untested, 1, $1.25; 6, $6.50; 12, $12; 50, $47.50; 100, $90. Virgins, 45c each. No disease, and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

FOR SALE—Italian queens, $2 each; select tested, $4. F. Barber, Lowville, N. Y.

FOR SALE—Three-banded Italian queens from best honey-gathering strain obtainable (no disease), untested queens, $1.25 each; 6, $6.50; 12, $12; select untested, $1.50 each; 12, $14. Safe arrival and satisfaction guaranteed. Your orders filled promptly.
Alabama Bee Co., Rt. 1, Fort Deposit, Ala.

WE are offering for remainder of season our bright Italian queens, untested at $1 each, $10 per dozen, $75 per hundred. We guarantee safe arrival, pure mating and reasonable satisfaction in United States and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated.
Graydon Bros., Rt. 4, Greenville, Ala.

CALIFORNIA ITALIAN QUEENS at special prices. After June 15 and to October 1, 1, $1.25; 6, $7; 12, $13; 25 ond over, $1 each; 100, $90. See larger ad elsewhere. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Cal.

NUCLEI—We make a specialty of shipping 2-frame nuclei. Write for special prices for June delivery. Queens at the following prices: Untested, $1.50 each; 6, $8; 12, $15; 50, $60; 100, $100. Tested queens, $2.50 each.
Cotton Belt Apiaries, Roxton, Texas.

FOR SALE—Fine tested queens, year old, $2; Silver Spangled Hamburg chickens and eggs; rare old violin.
Elias Fox, Union Center, Wis.

THE ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each, 6 for $8; tested $2.50 each; select tested, $3. Prof. W. A. Matheny,
Ohio University, Athens, Ohio.

LARGE, HARDY, PROLIFIC QUEENS—Three-band Italians and goldens, pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. After June 1, untested queens $1.50 each, 6 for $8, 12 or more $1.40 each, 25 or more $1.25 each. Tested queens $3 each, 6 for $16.
Buckeye Bee Co., Justus, O.

QUEENS—I am now offering queens at pre-war prices. Untested, 1, $1.25; 25 or more, $1 each.
W. H. Moses, Lane City, Texas.

HONEY AND BEESWAX

WHITE sweet clover honey with small per cent of basswood, in 5-gallon cans, case of 2 cans, $14, one can $7.50. Ten cases at 10c per pound. Sample 10c. C. S. Engle,
200 Center St., Sioux City, Iowa.

HONEY—15c per pound. Walter Reppert,
Gen. Deliv., Shreveport, La.

FOR SALE—Choice clover extracted honey. State quantity wanted.
J. D. Beals, Oto, Iowa.

FOR SALE—Very fine quality basswood-milkweed mostly milkweed) honey in 60-pound cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

HONEY FOR SALE—In 60-lb. tins, immediate shipment f. o. b. New York. California white orange, 18c lb.; California white sage, 16c lb.; white sweet clover, 15c lb.; light amber sage, 12c lb.; West Indian light amber, 10c lb. Hoffman & Hauck, Inc.,
Woodhaven, N. Y.

WANTED—Six thousand pounds of off-grade, extracted amber honey. Submit sample and quote price f. o. b. Terre Haute, Ind.
W. A. Hunter, 119 S Third St.

FOR SALE—New crop fancy white comb honey, No. 1, $7 per case of 24 sections; No. 2 grade, $6; clover extracted honey, 15c per pound; amber and buckwheat, 12½c, two 60-lb. cans to case; amber in 50-gallon barrels, 10c per pound.
H. G. Quirin, Bellevue, Ohio.

HONEY WANTED—Give particulars in first letter. Elton Warner,
"Beaverdam," Asheville, N. C.

NEW HONEY soon, best quality, reasonable prices, any quantity.
E. F. Atwater, Meridian, Idaho.

SUPPLIES

SAVE MONEY on your shipping cases, tin and glass honey containers, etc. Our free price list tells you how. If you rear queens for sale, be sure to send for our price card of mailing cages. The Rattery-Hamilton Co.,
Almont, Mich.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.
The Colorado Honey Producers' Association,
Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.
American Bee Journal, Hamilton, Ill.

BEEKEEPERS—Sag proof Hoffman frames, regular depth, corner cut, end bars drilled (not pierced), metal eyelets easily inserted. Price, with eyelets and nails, per 100, $8.90; 500, $42.85. Shipping cases, basswood, 24 lbs., holding 24 sections; price, with nails and corrugated paper, per 10, $6.90; 50, $31.80; 100, $61.50. Price, with 2-inch glass, 5c per case extra. State size. Satisfaction guaranteed.
Emil J. Siemers, Eau Claire, Wis., Box 204.

BARGAINS IN SUPPLIES—Ten-frame hive-bodies, each 67c; 8 frame, 64c. Ten-frame hive-covers, each 42c; 8-frame, 40c. Ten-frame bottoms, each 41c; 8-frame, 39c. Order at once. Write for further particulars, if wanted.
W. J. Forehand & Sons, Fort Deposit, Ala.

CLOSING OUT—Best No. 1 sections, per 500, $6.45. No. 2, $5.85. Special prices on other goods.
H. S. Duby, St. Anne, Ill.

FOR SALE—Hives, frames, supers, covers, bottoms and odd size hives and frames made to order. Write for money-saving prices on what you need. I can save you money.
F. D. Bowers, Sugar Grove, Pa.

FOR SALE

FOR SALE—Several hundred used 60-pound honey cans, 2 to the case. Used only once, 65c each. P. H. Outzen,
White Bear Lake, Minn.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—20 colonies Italian bees, in good shape, in 8 and 10-frame modern hives.
A. C. Gould, Weston, W. Va., Rt. 4.

FOR SALE—Power hive-making saw, $30; typewriter, $10; Peterson capping melter, $6; lathe, $3; 3x5 printing press outfit, $8.
Clarence Foote, Delanson, N. Y.

FOR SALE—Ill health; sell or lease; 50 clean colonies, mostly golden and leather colored Italians in 8 and 10-frame standard painted hives. 85 new 8 and 10-frame cedar standard hives, painted, wired foundation. 50 section supers ready for the bees. 20 covers and bottom boards, painted; 500 4¼x4¼ sections. Tools, etc.; no junk. Best fireweed location. If taken at once, $900 cash.
Paul Jackson, Klaber, Wash.

FOR SALE—Novice 2-frame extractor, $27; 5 Ideal super section starters, 8-frame, $10.
S. Collyer, Black Mountain, N. C.

FOR SALE—Two-frame Cowan reversible extractor; cost $45 last fall, goes for $30. Will handle 12-inch frame.
Jack Trayer, Cottonwood Falls, Kans.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

WANTED

WANTED—We have many calls from educators for copies to complete their files of the older Bee Journals. If you have complete volumes or miscellaneous numbers of any Bee Journals previous to 1900, write us, giving a list, and we will be glad to quote a price. Old bee books, now out of print, are also desirable. We act as a clearing house for this kind of materials.
American Bee Journal, Hamilton, Ill.

WANTED—Bees in colonies, comb and extracted honey. Frank Coyle, Penfield, Ill.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.
A. I. Root Co., Council Bluffs, Iowa.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

SITUATIONS

WANTED—Man with some experience to work with bees coming season. State age, experience and wages wanted, based on our furnishing board.
The Rocky Mountain Bee. Co.,
Box 1319, Billings, Mont.

MISCELLANEOUS

SAMPLE FREE—They say "It's as good now as when Hutchinson ran it." Under new ownership, our bee journal is growing fast, better every issue, a "different" kind of a journal. Let's get acquainted. $1.50 a year, and worth it.
The Domestic Beekeeper, Lansing, Mich.

WRITE for prices on two and three-frame nuclei and queens, cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

LEAGUE EMBLEMS—We still have a number of U. S. Beekeepers' emblems, buttons or pins, bronze or gold. Send 50 cents and get one
American Bee Journal, Hamilton, Ill.

BLACK SIBERIAN HARES—Enormous sizes, delicious meat and beautiful fur. Write for information and prices.
Siberian Fur Farm, Hamilton, Canada.

DR. MILLER'S BEE SONGS are in "Songs of Beedom.' Ten songs for 20 cents, postpaid; 2-cent stamps taken. Also Teddy Bear souvenir postal cards, 10 for 10 cents. Address Geo. W. York, Box 84, Spokane, Wash.

Michigan Summer Meet

At Alpena, August 3 and 4, Ernest Root, Geo. S. Demuth, E. W. Atkins and B. F. Kindig are on the program. These meetings are always well attended. Alpena is in the northern part of the lower peninsula, where beekeepers can see the possibilities of that region.

Crop and Market Report

Compiled by M. G. Dadant

Peculiar conditions have confronted beekeepers in many sections of the country this spring, conditions which are hard to meet, even by the experienced beekeeper who has seen many ups and downs.

A mild winter brought the bees out in fine condition, but so short of honey that feeding became necessary, in many instances, from the first examination in the spring.

Then when the bees were building up, even abnormally early, in good shape, a heavy freeze came which destroyed all early bloom. Early bloom of fruits, dandelion, locust, etc., is depended upon in many sections of the middle west as the proper stimulation for getting the bees into best condition for clover to follow.

This period of honey dearth has been followed by spotted rains; that is, some sections are wet while others have been dry. In the last two weeks, rains have become more general, but too late to insure much surplus from clover in the central west, though possibly hopeful builders for fall bloom.

The honey harvest of the middle west, therefore, will not be large for the clover crop, and this applies as well to the East, although there are spotted regions where the bees are storing a surplus.

In the Southeast the crop has been neither large nor small. Early Texas bloom was short, but conditions are improving and have been improving for the past month.

The inter-mountain territory will likely have a good crop, though the web-worm moth is again working on the alfalfa.

Southern California reports the poorest crop, and prospects for years, while northern California seems to be faring better.

HONEY ON HAND

There is still a large supply of the 1920 crop on hand and it is moving very slowly. In Arizona and New Mexico a bulk of the crop had not moved on June 1, though much of it was being offered at 6 cents per pound for amber alfalfa. Heavy freight rates, competition of the imported honey, lack of exportation, low price of sugar, and general tendency of the public not to buy anything more than necessary, are all contributing causes.

Certainly the bulk of the new crop will be available long before the old stocks are disposed of.

The general feeling, however, seems to be optomistic, with the hope that there will be an upward tendency and stabilization at a better figure sometime in the fall or early winter.

GOVERNMENT HONEYBEE REPORT MAY 1

The Government honeybee report for May shows that the winter loss for 1920-21 was but 8.5 per cent, as against 14 per cent in 1919-20.

The condition of colonies was 97 per cent of normal, as against only 84 per cent in 1919, same date, and the condition of honey plants was almost exactly the same as on the same date last year. This honey plant condition has, however, greatly changed since the report was issued, and in our opinion, should now be placed much lower. Freezing of early bloom and lack of moisture in many localities being the contributing causes.

ONTARIO REPORT MAY 1

Twenty thousand colonies were reported upon for the white honey crop in Ontario. It shows an average winter loss of 2.3 per cent, with very little honey left in the hands of the producers. Prospects seem to be above the average in most sections of the Province.

IMPORTS AND EXPORTS

We can show woefully small exports of honey in the months of March and April, which have just been made public. The imports for March were 200,000 pounds, and the exports only 100,000 pounds. In April the exports and imports balanced each other at 100,000 pounds. This gives an idea of why honey is not moving better, for in 1919 we exported over nine million pounds, and even in 1920 nearly two million pounds.

Besides a minimum export, much more honey is coming in. Markets are having to be created for this honey within our own boundaries.

CALIFORNIA STATISTICS

Mr. E. H. Tucker, of the First National Bank of Los Angeles and the Los Angeles Trust and Savings Bank, acting as their statistician, estimates that California produces 15 per cent of the honey of the United States. Between 70 and 90 per cent of this is marketed outside the State. Of all honey sold outside the State of production, from one-third to one-half comes from California.

His figures, based upon those of the Chief of the Field Service of the U. S. Department of Agriculture, are for a production in the United States in 1920 of 250 million pounds of honey and 210 million pounds in 1919. Strange that 1920 census figures are already available for 38 States and that they show a total production of only 40 million pounds. Do the city apiaries unreported make up this huge discrepancy?

PRICE PROSPECTS, ETC.

Contrary to the expectations of some of our best statisticians, sugar continues to decline, being quoted in New York on June 15 at 6 cents per pound for granulated, with further declines probable, owing to the weakness of the raw stocks.

Moreover, exchange has again dipped down, the high mark of $4.00 for pound sterling having been reached in May. Naturally there will be a reticence on the part of other countries to buy, as long as the rate is so unfavorable against them.

The desire on the part of some producers to bend their energies this year for increase, owing to low prices, was partly thwarted by their not wanting to purchase hives, etc., at the high prices. Whether the price declines came in time to allow them to reconsider is problematical.

All in all, the outlook would not, on the face of it, appear rosy. Honey, like other farm products, went through its deflation all at once. The general belief is that all farm products will gradually seek a stable and more remunerative level with fall and winter. Should not honey be expected to undergo the same changes? We hope so.

In the meantime, energetic efforts cannot be in vain. No chance should be lost to sell honey, locally. To push its value as a food, as a sweet, and every agency or organization which has for its aim the popularization and the sale of honey should be gotten behind and pushed. We have passed through a period when honey sold itself, when the producer and seller set the price. We are now watching the buyer set the price or refuse to buy. All the more reason for us to push our product and help create the demand.

REDUCED PRICES

IN ROOT QUALITY SUPPLIES

Based on present and prospective raw material cost and wage reductions, The A. I. Root Company has reduced bee supply prices to help get the nation's business "back to normal," as promised on page two of our 1921 spring catalog. Write at once, if you do not get your copy of our price list on

ROOT'S DISCOUNT SALE

Important Summer Price Reductions

As these discounts from our summer catalog prices are subject to withdrawal without notice, and as they will result in large orders, we suggest that you order immediately

Discounts are as follows:

40 Per Cent

Frames, Cartons (for comb honey) **Untested Queens, Bees.**

35 Per Cent

Sections, Shipping Cases.

25 Per Cent

Hives (flat), **Inside Furniture, Honey Boards, Cages, Beginners' Outfits.**

10 Per Cent

Honey and Wax Extractors, Smokers, Knives, Traps, Metal Goods.

AIRCO COMB FOUNDATION IS REDUCED 10c PER POUND

No discount on Buckeye hives, books, glass, tin or sundry unnamed items
These discounts have no relation whatever to any special price quoted in our close-out list or elsewhere. They apply only to our REGULAR 114th EDITION, SPRING 1921

MAKE HAY WHILE THE SUN SHINES

Now is the time to complete and better your equipment, extractors, honey boards, traps, smokers and veils
Supplies ready at hand—foundation, sections, cartons, shipping cases, glass and tin containers, will save you time which may be used in producing more honey

WHY BUY ROOT QUALITY BEE SUPPLIES?

You believe thoroughness to be the biggest factor in success
And to get thoroughness you want the best bee supplies money will buy. Equipment all standardized on Root quality is one big aid to thorough work. Root supplies mean accurate and fast work.
Time saved by fast work is the time that takes care of more colonies
You will find the Root quality, top quality, and Root treatment now called service, man to man treatment

THE A. I. ROOT COMPANY

MEDINA, OHIO, U. S. A.